The Journal of Obstetrics and Gynæcology of the British Empire

VOL. IX. MARCH, 1906. No. 3.

Recent Researches into the Bacteriology of Peritonitis in Relation to Pelvic Surgery.

By PERCY W. G. SARGENT, M.A., M.B., B.C.(Cantab.), F.R.C.S.(Eng.),
Assistant Surgeon to St. Thomas's Hospital and to the Victoria Hospital for Children, Chelsea; Erasmus Wilson Lecturer, Royal College of Surgeons of England.

PERITONITIS is no longer regarded as an independent disease, but is rightly recognised as a serious complication, and too often as a terminal event, of many widely different pathological conditions. Many of the diseases from which peritonitis may originate are in themselves not dangerous to life; others are, if unrelieved, necessarily fatal. For example, inflammation of the vermiform appendix, as such, is of no particular importance, and in the absence of complications is devoid of danger; but the peritoneal infection to which it so frequently gives rise is, especially if improperly treated, attended with the very gravest risk. Intestinal obstruction, on the other hand, will, if unrelieved, inevitably lead to a fatal issue, and this event is in most cases hastened or determined by the peritonitis which, sooner or later, makes its appearance. Similarly, the perforation of a gastric ulcer, if untreated by surgical means, brings about the fatal issue by the peritonitis to which it gives rise.

The gross causes of peritonitis are therefore many, and their prompt and appropriate surgical treatment will in very many cases prevent the onset of, or arrest at a very early stage, the peritonitis which otherwise threatens the patient's life.

The means by which the peritoneum may become infected are:—

1. Through accidental or operation wounds.

2. By the rupture or perforation of a hollow viscus, a cyst or an abscess.

3. By the passage of micro-organisms from an inflamed, but not perforated, hollow viscus, cyst or abscess.

4. By the indirect infection of blood extravasated into the peritoneal cavity in too great a quantity to be disposed of by the natural absorptive agency of the peritoneum.

5. By infection by way of the blood-stream, as in septicæmic peritonitis.

Such are the well-known means by which infection may reach the peritoneum; but there is a far more important point to consider, namely, the nature of the infection. What are the micro-organisms which are responsible for the peritonitis arising from these several causes, what is their relative frequency, and how may they be scientifically dealt with? A knowledge of this, the essential causation of peritonitis, is necessary if we are to be ready to deal in a rational manner with this most serious complication of so many diseases and accidents.

Attempts to throw light upon the question have from time to time been made by various observers, particularly by Tavel and Lanz.[1] More recently a large number of cases have been investigated by L. S. Dudgeon and myself, and it is to my collaborator (Mr. Dudgeon) that is due the entire credit of the bacteriological observations upon which this paper is based.

It stands to reason that if we can demonstrate a number of different bacteria to be, at different times and from various sources, the cause of peritonitis, and can, either by the symptoms, by the conditions observed at operation, or by rapid bacteriological methods, recognise that a given case is due to the presence of one or other of these organisms, we are in a better position to apply the appropriate treatment (after dealing with the source of the infection) to the peritonitis itself, and to give a prognosis.

In examining the literature of the subject we found that the current ideas with regard to the bacteriology of peritonitis were in a state of complete confusion. Through the stages from "idiopathic" and "chemical" peritonitis, over which some occult agency of a non-bacterial nature was supposed to preside, up to the rather hopeless conclusion that at any rate most cases were due to a multiple infection we pass *en route* other theories, such as that which ascribes the causation to various pyogenic organisms whose activity rapidly becomes overshadowed by that of the ubiquitous colon bacillus. We found that by examining bacteriologically all kinds of peritoneal lesions in many different stages, and by considering the subject as a whole, rather than by concentrating the attention upon one particular

form of peritonitis, we were able to differentiate certain types according to the kind of infection. For instance, the peritonitis arising from appendicitis is identical in type with that resulting from the later stages of intestinal obstruction, and occasionally with that found in certain cases of infection of the contents of an ovarian cyst.

The most important and frequent organisms concerned in peritonitis are the staphylococcus albus and the colon bacillus. After these may be placed the streptococcus pyogenes, bacillus pyocyaneus, pneumococcus, gonococcus, and, rarely, the staphylococcus aureus. We claim to have established the pre-eminence of the colon bacillus as a cause of peritonitis, and to have disproved what is perhaps the favourite theory—for it is only theory—of the present day, namely, that the initial lesions of peritonitis of intestinal origin are due to the common pyogenic cocci, but that these organisms are so rapidly outgrown by the colon bacillus that they are not capable of being identified in the peritoneal cavity. Our observations convinced us that such is not the case. The full details of the bacteriological work have been published elsewhere,[2] and it is sufficient to say here that our conclusions were based upon a large series of observations concerning in the main three lines of research—firstly, the study of the bacteria found in different parts of the peritoneal cavity in many stages of peritonitis; secondly, the comparison of coverslip preparations with both anærobic and ærobic culture methods; and, thirdly, the specific agglutinative reaction of the patients' serum upon the organisms isolated. I have placed the staphylococcus albus first because it is the organism most frequently found in the peritoneal cavity. It appears, however, to exercise an influence which is the reverse of harmful, for it undoubtedly provokes the appearance of an exudate containing vast numbers of phagocytic cells, and it is upon the presence of these cells and their power of dealing with the organisms that the chances of recovery depend.

Out of a total of 258 cases of peritoneal lesions of all kinds this coccus was isolated no less than 108 times, whilst in 17 other instances a similar staphylococcus was present but was not definitely identified. When present it is the first organism to appear and the last to disappear. In cases of localised peri-cæcal suppuration, for example, this staphylococcus is found beyond the limits of the abscess in 77 per cent.; when the abscess has been dealt with, and the patient returns some weeks later for the removal of the appendix, the coccus is still present upon the peritoneum in the cæcal region in 62 per cent. Similarly, we

demonstrated the connection of the coccus with peritoneal lesions arising from many other causes.

The colon bacillus, in one or other of its varieties, is undoubtedly the commonest causative agent of peritonitis, and may exhibit a degree of virulence second only to that of the streptococcus pyogenes. The type of peritonitis to which it gives rise varies according to many factors. No doubt the particular degree of virulence is the factor of greatest moment, but another which cannot be far behind in importance is the time which the peritoneum has had to bring into play its natural protective mechanism. A virulent infection suddenly launched upon an unprepared peritoneum is far more likely to end fatally than if there has previously been a slight or a chronic inflammation.

Apart from puerperal peritonitis, of which our series of observations afforded no example, and of which we are unable therefore to speak at first hand, we have no hesitation in saying that the streptococcus pyogenes is of comparatively rare occurrence as a cause of peritonitis. When present it gives rise to a very rapidly fatal form of peritonitis, for the leucocytes which make their appearance in the peritoneal cavity, and which constitute in other infections the chief line of defence, appear to be powerless against a streptococcic infection. Of the bacillus pyocyaneus, the pneumococcus and the gonococcus as causes of peritonitis in general, it may be said that they are of rare occurrence.

So far I have spoken of the various micro-organisms as they are found in peritonitis in general. In the consideration of the peritonitis arising from diseases of the female pelvic organs it will be seen that the relative frequency of these various organisms becomes altered, and as they vary greatly in their virulence and it so happens that the less virulent are those most commonly met with, it follows that the mortality from peritonitis arising in this region is low when compared with that of peritonitis in general. It is often stated that the pelvic peritoneum is less easily infected than the abdominal, but this is not the case. The true explanation is to be found in the comparatively low degree of virulence of the organisms commonly met with in gynæcological work.

I propose to deal with the peritonitis met with in gynæcological work under five headings, arranging them according to their usual severity and at the same time, speaking generally, according to the organisms commonly present:—

1. Extra-uterine gestation.
2. Salpingitis.

3. Inflamed ovarian cysts.
4. Infections connected with pregnancy.
5. Accidental infections.

1. *Extra-uterine Gestation.*

One of the simplest forms of peritonitis is that which follows hæmorrhage into the peritoneal cavity. When leakage takes place from a pregnant Fallopian tube, the blood becomes surrounded and shut off from the general peritoneal cavity by the adhesion of neighbouring peritoneal surfaces to one another so as to form a hæmatocele. This adhesion is evidence of peritonitis. If the blood escapes more rapidly, but not so rapidly as to be immediately fatal, peritonitis is produced over a wider area, but without time for the formation of limiting adhesions. The process is the same in the two cases. This form of peritonitis was formerly spoken of as "chemical" peritonitis, but it has been established that there is to be found in the peritoneal cavity, and especially in the older clot therein, a white staphylococcus of a low degree of pathogenicity. In our own series this organism was present in every case of seventeen examined. The same is true of hæmorrhage into the peritoneal cavity from ruptured liver or spleen. This is the same organism which is found so frequently in cases of intestinal obstruction and strangulated hernia, and in so many other varieties of peritonitis. It is the organism which, when inoculated into the peritoneal cavity of guinea-pigs, produces such an abundant leucocytosis as to be able to protect the animal against an otherwise lethal dose of the colon bacillus which may subsequently be inoculated. In many cases the patient's blood serum gives a specific agglutinative reaction with this staphylococcus. The degree of the reaction varies directly with the length of the illness.

It is well known that many cases of intra-peritoneal hæmorrhage from extra-uterine gestation show a varying, sometimes a considerable, degree of fever, both before and after operation, even in the absence of any cause such as suppuration of the wound or post-operative pulmonary complications. Both the peritonitis and the fever are to be attributed to the presence of the staphylococcus albus which is so constantly found to be present. It must be distinctly understood that this white staphylococcus is not the same organism as the staphylococcus *pyogenes* albus described by Rosenbach, but that it closely resembles the white staphylococcus which, several years ago, was isolated by Prof. Welch[3] from aseptic wounds. Its presence therefore is not indicative of "sepsis" in the ordinary clinical significance of the term. Very rarely indeed, under modern conditions, does the wound made in dealing with cases of extra-uterine

gestation fail to heal by primary union. From Welch's observations and from our own, as well as from those of other observers, it is evident that "aseptic" and "sterile" are by no means synonymous terms. The question as to how far an aseptic wound is sterile, and what part micro-organisms may play in the healing of aseptic wounds is one which opens up a wide field for research.

What is the practical bearing of these observations? They are of importance in what I may term the general scheme of peritonitis; they fall into harmony with the observations made upon peritonitis of all kinds. Every case of ruptured tubal pregnancy must be regarded as a case of peritonitis, which, although it may be mild in degree and extent, and of itself clinically unimportant, bears in a very important manner upon the question of peritonitis in general and its treatment.

2. *Salpingitis.*

Salpinigitis is one of the most common causes of peritonitis as met with in gynæcological work. It is well recognised that inflammatory diseases of the Fallopian tubes may give rise to a mild form of peritonitis, either by direct extension or occasionally by rupture. Although the peritonitis resulting from hæmorrhage from a Fallopian tube has been hitherto regarded as a non-bacterial process, yet that resulting from a pyosalpinx has been assumed readily enough to be due to micro-organisms. It is nevertheless a matter of common observation that a pyosalpinx may be burst in removing it, and may flood the peritoneum with its purulent contents without any harm resulting.

It was long thought that the gonococcus was incapable of surviving in the peritoneal cavity, and, to account for peritonitis resulting from a pyosalpinx, which might itself be gonorrhœal in origin, the theory was advanced that the "ordinary pyogenic organisms" must have gained admission. This is a theory which is undoubtedly erroneous. Not only is it "not proven," but all the known facts point in the opposite direction.

It is important, in the first place, to know the bacteriology of the contents of a pyosalpinx. A sufficient number of cases have been collected by E. T. Andrews[4] to give a very good idea of the bacteriological condition of such abscesses. In 1904 Dr. Andrews published the results of bacteriological examinations in 684 collected cases, and although in many cases those examinations were incomplete, yet they go to show in what a very small proportion of cases of pyosalpinx there is any grave danger to the peritoneum. His results

showed 55 per cent. to contain the gonococcus, 6 per cent. saprophytes only, and the rest a variety of micro-organisms. We need not, therefore, assume any special property of the pelvic peritoneum against infection (which indeed has not been shown to exist) to account for the excellent results obtained from operations upon pyosalpinx, even when the contents have accidentally been allowed to escape freely into the peritoneal cavity. In more than half the cases of pyosalpinx no organisms are found, either in film preparations or by culture methods. The contents of these sacs would therefore be harmless. Nearly half of the remainder show evidence of the gonococcus, and the question naturally arises whether there is an unmixed form of peritonitis due to this organism.

As long ago as 1891 Wertheim [5] proved the gonococcus to be capable of producing peritonitis in animals. He recovered it in pure culture from the sero-purulent exudate. Although in 1898 Kelly [6] stated that in many hundreds of bacteriological examinations he had never been able to demonstrate the gonococcus as the etiological factor in the production of peritonitis, yet in the following year Harvey Cushing [7] was able to demonstrate the presence of this coccus in two cases of peritonitis (in one culturally); and Hugh Young [8] has also succeeded in cultivating it from the exudate in cases of gonorrhœal peritonitis.

In five of the eight cases which L. S. Dudgeon and I examined we found both the interior of the tubes and the peritoneal exudate to be sterile, but in one there were large numbers of gonococci seen in film preparations from both situations. No doubt the etiological association of the gonococcus is one that, from the difficulties attendant upon cultivation, is difficult of proof. But, as stated above, certain observers of undisputed authority have produced definite proof in a few instances; and when we consider that the apparent sterility when ordinary methods of cultivation are employed demonstrates the absence of the ordinary pyogenic organisms, it must be recognised that the gonococcus is an actual and probably a common cause of peritonitis.

The clinical aspects of diffuse gonorrhœal peritonitis may be described as follows: The onset is usually sudden, but not very severe, and the subsequent symptoms are those of a very mild form of peritonitis which may under certain circumstances subside without operation and result in the formation of adhesions in the pelvis. It may become localised and give rise to an intra-peritoneal abscess. In the diffuse form the peritoneal exudate is usually clear, distinctly viscid, and somewhat of a straw colour. Microscopically the exudate

shows polymorphonuclear leucocytes, not very abundant, and occasionally intra-cellular gram-negative diplococci. The intestines in the affected area are but slightly reddened, and distension is usually absent, in this respect differing markedly from the appearances seen in the more severe forms of peritoneal infection. When the source of infection has been removed and the exudate mopped or washed out of the pelvis there is no need for drainage of the peritoneal cavity or of the wound, and the prognosis is exceedingly favourable.

4. *Inflamed Ovarian Cysts.*

We do not know sufficient of the bacteriology of inflamed ovarian cysts to be able to generalise upon this subject, but three cases in which the bacteriology was investigated are of interest, inasmuch as the emphasize the importance of the colon bacillus in peritonitis, and also the fatal nature of a streptococcic infection. The peritonitis arising from inflamed or suppurating ovarian cysts appears to be of quite a different character from that which is usually associated with inflamed or suppurating Fallopian tubes, and may be looked upon as a connecting link with peritonitis of intestinal origin. These cases are of sufficient interest to recount shortly here.

The first concerned a woman, 35 years of ago, who for two months had noticed an abdominal tumour, which had been painful for four weeks. For two days she had been acutely ill with abdominal pain and vomiting. When admitted she presented all the signs of diffuse peritonitis; the pulse was 120, and the temperature 100°. The abdomen was opened, and the intestines found to be red and distended, whilst offensive turbid fluid and some gas were present in the peritoneal cavity. On one side was a large multilocular ovarian cyst containing clear mucoid fluid; on the other a similar cyst, but gangrenous and containing thick offensive pus. The pedicle was not twisted. Both cysts were removed, and the pelvis flushed out and drained. Death occurred on the third day, and the autopsy revealed a condition of universal peritonitis. The bacteriology of this case is of particular interest as it is exactly similar to that of the great majority of cases of peritonitis arising from appendicitis. The staphylococcus albus was present in the exudate at a distance from the region of most intense inflammation, whilst the colon bacillus was obtained in pure culture from the contents of both cysts.

The second patient was a woman, 30 years of age, who after an illness of three months' duration, accompanied by vaginal discharge and pelvic symptoms, was seized seven days before admission with acute abdominal pain and sickness. The temperature had ranged

from 101° to 103° for five days. When admitted the pulse was 120, and the temperature 101°; the abdomen was distended and rigid, and a mass was felt per vaginam. On opening the abdomen the intestines appeared normal save for the presence of a few ounces of clear odourless fluid which bathed them. In the left side of the pelvis was a tubo-ovarian abscess containing thin offensive pus, which, together with a right-sided pyosalpinx, was removed. The pelvis was flushed out and drained. Death occurred from diffuse peritonitis on the second day. In this instance the clear fluid proved to be sterile. The pus from the abscess showed only, both in films and cultures, the colon bacillus.

The third case concerned a woman, 30 years of age, who for a fortnight had suffered from slight abdominal pain. Three days before admission she was seized with severe pain and vomiting, and when admitted she presented the signs of diffuse peritonitis, with a pulse rate of 120 and a temperature of 100°. The peritoneal exudate proved to be large in amount, and consisted of purulent fluid. The intestines were everywhere distended and reddened. A right-sided ovarian cyst, the size of an orange, had suppurated and burst, presenting a ragged aperture large enough to admit the finger. The Fallopian tubes were normal. The cyst was removed and the abdomen flushed out and drained, but the patient died within a few hours. In this case the peritoneal exudate at a distance contained the staphylococcus albus in pure culture, whilst from the purulent fluid and the surface of the cyst was obtained a pure culture of the streptococcus pyogenes.

These three cases therefore are bacteriologically and clinically similar to cases of peritonitis arising from appendicitis. In two the lethal organism was the colon bacillus, and in one the streptococcus pyogenes. This latter organism, however, is only rarely, as we have proved, found in connection with appendicitis. The resemblance is still further borne out by the fact that the staphylococcus albus was present in pure culture in the exudate at a distance from the primary focus of infection, as is so frequently the case in peritonitis of appendicular or intestinal origin. The bearing of these facts upon treatment will be discussed later.

4. *Infections connected with Pregnancy.*

Of puerperal peritonitis I can say little at first hand, because no case occurred in our series. However, there seems to be little doubt, from the writings of other observers, that many of these cases are of streptococcic origin. Dr. Foulerton [9] has shown that a very large

percentage of cases of puerperal sepsis are due to one or other of the varieties of pyogenic streptococci, and there is every facility for the spread of such infections from the uterus to the peritoneum. Moreover the clinical aspect harmonises with that of those cases of streptococcic peritonitis such as the septicæmic and the post-operative which L. S. Dudgeon and I examined.

We believe streptococcic peritonitis to be uniformly fatal. At any rate it is certainly the most virulent form that we know, possibly with the rare exception of peritonitis due to the bacillus pyocyaneus. Possibly some forms of streptococci, as differentiated recently by Dr. Gordon,[13] may be less virulent in the peritoneal cavity than others, but of this we have no evidence as yet. In any peritoneal infection recovery depends upon the ability of the leucocytes which are evoked to deal with the infection. In the streptococcic cases the cells appear powerless to exert an effective phagocytic action, hence death is the usual result of a streptococcic infection of the peritoneum.

5. *Accidental Infections.*

Post-operative peritonitis exhibits more varied bacterial conditions than does any other form of peritonitis. Of most varieties we may say that there is one organism which predominates, whilst others are of rare occurrence. Thus in peritonitis of intestinal origin it is the colon bacillus which is the most constant etiological factor; in stomach perforations it is a peculiar organism described in detail by L. S. Dudgeon and called the strepto-diplococcus; in salpingitis it is the gonococcus; and in intra-peritoneal hæmorrhage it is the staphylococcus albus. But in accidental infections we may find almost any of the pyogenic organisms as the etiological factors.

In one case of my own the fatal peritonitis was due to the bacillus pyocyaneus, an organism rare as a cause of peritonitis, but when present appearing to be in virulence second only to the streptococcus pyogenes. In this case a pelvic abscess appeared three weeks after supra-vaginal hysterectomy for fibromyomata. The pus of this abscess yielded a pure culture of the bacillus pyocyaneus, and death occurred from diffuse peritonitis on the second day after opening the abscess.

In another instance a large localized intra-peritoneal abscess formed a fortnight after myomectomy. The pus yielded a pure culture of the staphylococcus aureus, and the patient recovered. In a series of four cases of fatal peritonitis following pelvic operations investigated by Dr. Cullen[10] in 1895 there were found—in one the streptococcus pyogenes and the colon bacillus, in another the

staphylococcus aureus and the bacillus pyocyaneus, in the third the staphylococcus aureus, and it the fourth the staphylococcus aureus and staphylococcus albus.

It might appear that the pneumococcus could not properly be included amongst the micro-organisms concerned in peritonitis of pelvic origin, yet this coccus was found in a case which occurred in our series. As the pneumococcus was found in a pyometra associated with peritonitis in a young girl, the case is of sufficient interest to relate here. It is also of particular interest inasmuch as certain observers have taught that, if in a child suffering from peritonitis, intracellular gram-negative diplococci are present in film preparations of the vaginal secretion, that fact provides sufficient evidence for regarding the case as one of gonorrhœal peritonitis. The patient, a child six years of age, was under the care of Mr. Cuthbert Wallace. She had been seized, whilst at school, with acute abdominal pain. The bowels were opened four times that day. Vomiting commenced on the following morning, and continued at short intervals for twenty-four hours. On admission the child looked extremely ill. The pulse was 140, and the temperature 103·2°, rising to 105·2° immediately before operation. The abdomen moved well on respiration, and was not distended, but was very tender on palpation. The lungs were normal, nor were there any signs of otitis or of meningitis. The abdomen was opened forty-eight hours after the onset of the illness. A small quantity of thin odourless pus was present, in which were suspended strings of fibrin. The intestines were reddened, but not distended, and the peritonitis was distinctly more marked in the lower half. The appendix was normal, and the Fallopian tubes did not appear to be more inflamed than the rest of the pelvic peritoneum. The abdominal cavity was flushed out with hot saline solution and closed. Death occurred two hours later. At the autopsy the lungs were found to be normal, as also were the rest of the structures above the diaphragm. The meninges were normal. The uterus contained about a drachm of pus.

Film preparations of the vaginal secretion, taken before operation, showed large numbers of gram-negative diplococci, chiefly intra-cellular. From the peritoneal exudate and from the pyometra pure cultures of the pneumococcus were obtained. Whether the organism in the vaginal secretion was the gonococcus or not was not certain, but the case at least shows that, because gram-negative intra-cellular diplococci are found in the vagina, they need not necessarily be the cause of the peritonitis arising in such a case.

The bearing of these bacteriological observations, in so far as they relate to pelvic surgery in particular, may be considered under the following headings:—

1. Operative treatment.
2. Drug treatment.
3. Specific serum treatment.

1. *Operative Treatment.*

It must be borne constantly in mind that in any peritoneal infection it is upon the leucocytes thrown out into the exudate, and upon their ability to act as phagocytes, that the so-called "tolerance" of the peritoneum and hence the chances of recovery of the patient chiefly depend. No doubt other factors, bactericidal or antitoxic, also come into play, but it cannot be denied that so far as the peritoneum is concerned it is the phagocytic action of the leucocytes evoked which is of the first importance. The first duty of the operator therefore is to see that he does not interfere with the natural mode of resistance, but that by dealing with the source of infection, by removing dead material and *where necessary* providing for drainage, he directs his efforts to assisting it. Any heroic measures therefore in the direction of evisceration and copious douching are far more likely to do harm than good. Strictly local lavage with sterilized saline solution, or gentle dry mopping of any exudate which may be present in the part of the peritoneal cavity which is chiefly affected, are the only measures of cleansing which should be attempted. It is quite impossible to wash the peritoneum clean, but it is very easy to wash away the phagocyte-containing exudate beyond the region of most intense inflammation.

These remarks apply with far more force to the more virulent infections, as, for example, those due to the colon bacillus, than to such mild cases as those due to the gonococcus or the staphylococcus albus. When blood has escaped into the peritoneal cavity from a pregnant Fallopian tube, the changes which it undergoes are largely dependent upon its quantity. Small amounts can undoubtedly be safely dealt with by the peritoneum, but larger amounts if escaping slowly become localised into blood cysts by a process of adhesive peritonitis. Larger amounts if extravasated with rapidity and escaping all over the peritoneal cavity may, if the patient survive several days, set up a condition of diffuse peritonitis. In either case this peritonitis is due to the staphylococcus albus. But the localized hæmatocele represents, quite apart from the condition which caused it, not a danger escaped but a danger postponed.

Such a collection of blood is liable to become infected with other organisms, and to become the origin of one form of pelvic abscess. It is therefore of great importance that blood should be removed from the peritoneal cavity with promptitude, and to this end irrigation with normal saline solution is the best method available. And because of the mildness of the infection such irrigation will not have the same harmful effect that it is known to have in cases of infection with the colon bacillus.

Pathology therefore teaches us that in mild infections when there is much foreign material to be removed, copious and general irrigation should be employed, but that in the more virulent infections the cleansing treatment should be strictly localised, and the upper part of the peritoneal cavity left "severely alone." All turbid exudate is not pus, neither is it to be regarded as something to be washed away. In very many cases such an exudate is of the greatest possible value in dealing with the peritoneal infection, and, speaking generally, the outlook for the patient is far better when such exudate is present in the peritoneal cavity in regions remote from the area of most intense inflammation. Not only does copious irrigation remove this most important exudate, but it also spreads infection over areas of peritoneum which may be, as yet, unaffected.

The question of drainage is one upon which different surgeons hold diametrically opposite views. Here again a knowledge of the bacteriology of any particular condition is of value. The tendency of the present day is to avoid drainage tubes as far as possible, and though there are still surgeons who consider it necessary to drain a clean wound such as that left after the removal of the breast, yet experience has taught those who have abandoned such methods that their cases do as well or better without drainage.

What applies to the subcutaneous tissues applies with even greater force to the peritoneal cavity, inasmuch as the peritoneum is far more capable of looking after itself than are the subcutaneous tissues. Moreover the introduction of a tube either into the peritoneal cavity or into the subcutaneous tissues is of itself a source of danger. No one supposes that the skin long remains even approximately sterile after an operation, and it has been repeatedly shown with what rapidity a growth of micro-organisms, such as the pyogenic staphylococci, will extend along the track which a drainage tube provides for their accommodation.

Another not unimportant sequence of drainage of the abdomen is the formation of a ventral hernia, and although the possibility of such a complication should never be of any weight when considering

the question of drainage in a doubtful case, yet it should be seriously considered in connection with those numerous cases in which drainage is quite unnecessary. It may be laid down as a general rule that bacteriology as well as practical experience teach that drainage is unnecessary in the peritonitis connected with intra-peritoneal hæmorrhage and pyosalpinx, but that the more severe infections, such as that arising from a suppurating or gangrenous ovarian cyst, require that some form of drain should be employed. It is, however, rarely possible to do much good even in such cases, because the tube so rapidly becomes isolated by the agglutination around it of intestines or omentum that its practical utility ceases in a very short time, and the track thus formed becomes merely a useless sinus. These remarks apply of course only to the general peritoneal cavity. Localized collections are for practical purposes extra-peritoneal, and require the application of the same principles of treatment as do abscesses in another part of the body.

2. *Drug Treatment.*

Under this heading the only remarks which I have to make concern the administration of opium in any form. The liability of such opiates to mask symptoms is sufficiently well recognised, but it is not so well recognised that there are other dangers not less important. There is little doubt that the action of the bowels plays a very important part in the prognosis of a case of peritonitis. Intestinal paralysis is a symptom of the gravest moment, and anything which tends to assist in bringing about that fatal complication cannot be too strongly condemned. A dose of opium may just turn the balance against recovery, when a purge calculated to stimulate intestinal movements might have saved the patient's life. There is a prejudice against the administration of purges which depends upon the supposition that intestinal movements tend to spread the infection over the peritoneal surface. Such, however, has not been proved to be the case, and I would go even further, and suggest that the observations of H. E. Durham [11] and of L. S. Dudgeon point in precisely the opposite direction. It has been observed that organisms tend to settle upon the great omentum, and it is possible that this organ plays the part of an abdominal scavenger. If such be the case, then the intestinal movements would tend to bring infected areas into contact with the omentum and so assist in the transference of the organisms to a place where they are able to exert a less harmful action. There is yet another very cogent argument against the use of opium. Dudgeon and Ross [12] have shown that morphia inhibits

leucocytosis, and as the chief safeguard of the peritoneum lies in efficient phagocytosis, anything which interferes with that function will militate against recovery.

3. *Specific Serum Treatment.*

The future of this treatment, if there is a future of usefulness before it in the domain of peritonitis, must be largely influenced by an intelligent application to particular cases of the various sera obtainable. To inject an anti-streptococcic serum for a case of colon bacillus peritonitis is as wrong as it is useless. These remarks apply with greater force to the peritonitis met with in general abdominal than to that met with in pelvic surgery; but, as I have stated, there are occasions when colon bacillus peritonitis occurs in the practice of the gynæcologist. It can be recognised with sufficient rapidity to allow of the application of specific treatment if film preparations and cultures of the exudate are taken at the time of operation. The colon bacillus can be identified in as short a time as four hours in broth cultures incubated at 37°C. If film preparations of the exudate show chains of streptococci then it would be reasonable to employ an antistreptococcic serum; but if the colon bacillus can be identified as the cause, then the multivalent "anti-coli" serum which can now be obtained from a leading London firm, should be given a trial. In the few cases in which it has at present been used the results are at least sufficiently suggestive to warrant an extensive trial. But whatever serum is employed the following rules should be adhered to:—Firstly, a multivalent serum should be preferred to one prepared from a single strain of the organism in question; secondly, the dosage should be much larger than that which is commonly employed; thirdly, it should never be given merely as a last resource in desperate cases, for moribund tissues are incapable of responding to the serum, or even in some instances of absorbing it from the site of inoculation.

REFERENCES.

1. "Ueber die Ætiologie der Peritonitis." Basle, 1893. Also, *Revue de Chirurgie.* Paris, 1904.
2. "The Bacteriology of Peritonitis." London. 1905.
3. *Trans. of Assoc. of Amer. Phys. and Surg.* 1892
4. *Amer. Journ. of Obstet.* Feb., 1904.
5. Quoted by Cushing, Johns Hopkins Hosp. Reps. VIII. 1904.
6. *Ibid.*
7. *Ibid.*
8. John Hopkins Hosp. Reps. 1900.
9. *Lancet.* Vol. II., 1904, p. 1828.
10. Johns Hopkins Hosp. Reps. 1895. IV., 411.
11. *Med. Chir. Trans.* London. LXXX., 191.
12. *Path. Soc. Trans.* London. 1905.
13. *Lancet.* Vol II., 1905.

Example of a Pelvis Deformed in Consequence of Infantile Paralysis.*

By J. B. Hellier, M.D. (Lond.), *Honorary Obstetric Physician, Leeds Infirmary; Lecturer on Gynæcology in the University of Leeds.*

The variety of pelvic deformity which results from infantile palsy of one lower extremity does not receive much attention in English text-books of obstetrics. The best account of this subject that I have been able to find occurs in the third volume of Tarnier and Budin's *Traité de l'Art des Accouchements*. I reproduce here a diagrammatic sketch of the condition under consideration. (See Fig. 1). These are twofold:—(1) There is deficient development of the os innominatum of the paralysed side. (2) The normal physiological flattening which usually takes place between birth and maturity under gravity, is deficient or wanting on the paralysed side and exaggerated on the other side. This is due to the non-use of the paralysed leg and the consequent absence of pressure on the acetabulum. The weight being thrown on the sound side there is flattening of the pelvis on that side and an oblique deformity is caused. If, however, the affected leg should not have been wholly useless but have borne some appreciable amount of weight, it may be found that owing to the tenuity and weakness of the bone, the pelvis has yielded a good deal on the palsied side. This is not the case in the pelvis which I am about to describe, which corresponds very closely with the sketch shown, except that the left side and not the right is affected.

This pelvis came from a subject in the dissecting-room at the Leeds University, and I am indebted to Professor Wardrop Griffith and to Dr. J. K. Jamieson (who made the preparation) for the opportunity of showing it before this Society. The patient was a male, 39 years old, who died from phthisis. The left limb was shorter than the other by four inches, and was much atrophied, the sacral plexus was atrophic on the left and the obturator internus and pyriformis were scarcely to be found. The psoas was well developed. The patient had walked with a crutch. [The sacrum has been damaged during the excision of the spinal cord.]

* A paper read at the meeting of the North of England Obstetrical Society, January 19th, 1906.

Description of pelvis. On comparing the two ossa innominata it will be seen that the left is everywhere smaller and thinner than the other, owing to the atrophy consequent upon the anterior poliomyelitis. The difference is most marked in the ischia. The right ischio-pubic ramus has a breadth of $\frac{5}{8}$ in., while at the corresponding point the left is reduced to a slender shaft $^3/_{16}$ in. broad. The distance on the right side from the ilio-pectineal line to the lowest point of the tuber ischii is 4 in., but on the left is $\frac{7}{8}$ in. less, and the contrast between the two tubera ischii is most striking. The iliac bone with its crests and spines is everywhere smaller on the left side. The distance from the anterior to the posterior iliac spine is $6\frac{3}{4}$ ins. on the right and $5\frac{3}{4}$ ins. on the left, and the iliac crest is $\frac{7}{8}$ in. further from the ilio-pectineal line on the right than the left. The acetabulum is also somewhat smaller on the left.

Turning to the shape of the pelvis as a whole, we note that the left half of the pelvic brim is rounded, and that the right is flattened, so that the oblique diameter of the brim measured from the right sacro-iliac synchondrosis is 5 ins. against $4\frac{1}{2}$ ins. in the opposite oblique diameter. The distance from the centre of the sacral promontory to the centre of the ilio-pubic ramus is $3\frac{1}{2}$ ins. on the right, and $4\frac{1}{2}$ ins. on the left. The lower two lumbar vertebræ, which are included in the specimen, show indications of some degree of lateral curve, and the shape of the pelvis is somewhat oblique.

The sacrum shows little or no atrophy due to the palsy, but on the right side, where the weight was borne, the width of the wing of the sacrum is $1\frac{1}{8}$ ins. against $1\frac{1}{4}$ ins. on the palsied side, so that this measurement is less on the sound side.

The outlet of the pelvis is diminished. The distance between the ischial spines is $3\frac{1}{4}$ ins., and the lower end of the sacrum and the coccyx curve so far forwards that the tip of the coccyx comes within $1\frac{3}{4}$ ins. of the symphysis. This tip deviates to the right, being 1 in. from the right ischio-pubic ramus and $1\frac{3}{4}$ ins. from the left.

I think that this pelvis furnishes a specimen of considerable obstetrical interest, in spite of the fact that it comes from a male subject.

TABLE OF MEASUREMENTS.

Shortening of left leg ... ... 4 in.

	Right.	Left.
Width of ischio-pubic ramus	$\frac{5}{8}$ in.	$\frac{3}{16}$ in.
From ilio-pectineal line to lowest point of tuber ischii ...	4 in.	$3\frac{1}{8}$ in.
Anterior to posterior iliac spine	$6\frac{3}{4}$ in.	$5\frac{3}{4}$ in.

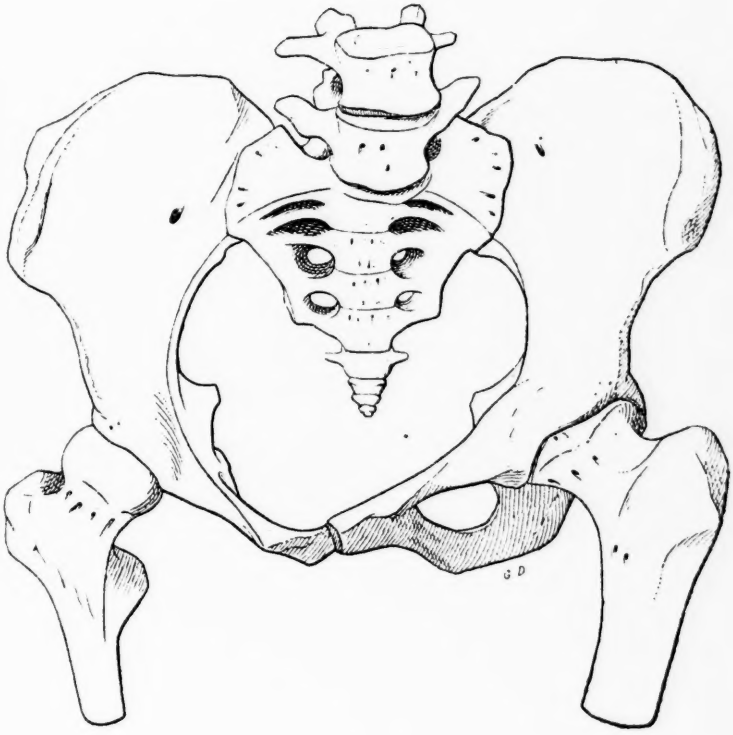


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Centre of iliac crest to ilio-pectineal line	$3\frac{7}{8}$ in.	3 in.
Greatest diameter of acetabulum	$2\frac{1}{8}$ in.	2 in.
Oblique diameter of brim	5 in.	$4\frac{1}{2}$ in.
Centre of sacral promontory to centre of ilio-pubic ramus	$3\frac{1}{2}$ in.	$4\frac{1}{2}$ in.
Width of wing of sacrum at base	$1\frac{1}{8}$ in.	$1\frac{1}{4}$ in.
Tip of coccyx to ischio-pubic ramus	1 in.	$1\frac{3}{4}$ in.
Tip of coccyx to symphysis pubis		$1\frac{3}{4}$ in.
True conjugate of brim		4 in.
Oblique conjugate		$4\frac{1}{2}$ in.
Transverse of brim		5 in.
Transverse of outlet		$3\frac{1}{4}$ in.

EXPLANATION OF FIGURES.

Figure 1. Sketch of a female pelvis deformed in consequence of infantile palsy on the right side. Taken from Tarnier et Budin, *Traité de l'Art des Accouchements*, Tome iii., p. 257, Paris, 1898.

Figure 2. Photograph of the male pelvis described in this paper. Note especially the small size of the left ilium, pubes and ischium, the deviation of the sacrum to the right, the relative flattening of the pelvic brim on the right, and the less width of the sacral wing on this side.

Figure 3. The same seen from behind (the sacral spines have been removed). Note especially the contrast between the tubera ischii.

Figure 4. The same. Pelvic outlet seen from below. Note the relative size of the right and left posterior iliac spines.

(Photographs taken by Mr. Oliver, of the Leeds Infirmary.)

A Second Case of Abdominal Ovariotomy during Labour, with Remarks.*

By Herbert R. Spencer, M.D., B.S., F.R.C.P., *Professor of Obstetric Medicine in University College, London; Obstetric Physician to University College Hospital.*

H. M., a primigravida, aged 24, was admitted to University College Hospital on August 9th, 1905. She stated that the abdomen had been tapped about three weeks previously, at a London lying-in hospital. Afterwards she was told that she had a tumour in addition to pregnancy, and was admitted to the general hospital to which her physician was attached, with a view to having the tumour removed. The patient, however, declined to have the operation done there and left, and, as the abdomen was rapidly increasing in size, she applied for treatment at University College Hospital.

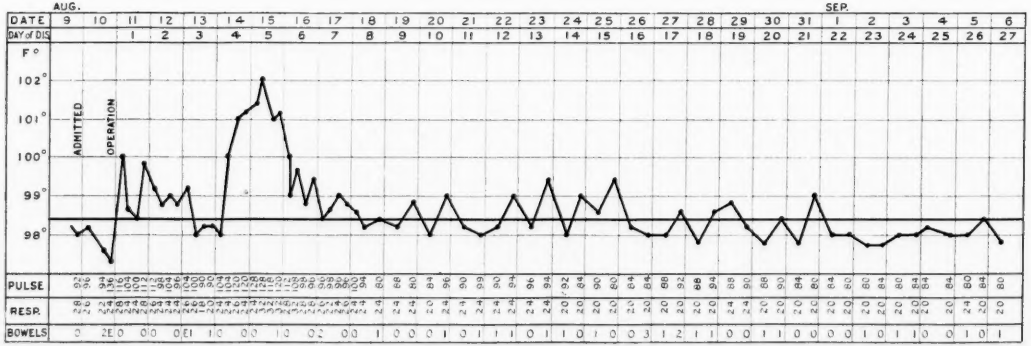
She was a little over eight months pregnant, having ceased to menstruate in the first week of December, 1904. She had always been regular previously. In the last three months the abdomen had swelled very rapidly, and since the tapping she had again increased greatly in size.

She had no pain before the swelling was noticed, but had had increasing pain since. The pain sometimes shot down the outside of the left thigh, which almost always felt numb. She had been losing flesh. There was no history of discharge from the vagina, and no history of tumour or cancer in the family.

I saw the patient on the morning of the 10th of August. She looked bloated in the face. The abdomen was enormously distended, measuring 47 inches in circumference (23½ inches on each side). From the ensiform cartilage to the umbilicus, the measurement was 13 inches, from the pubes to the umbilicus 12 inches. The surface of the abdomen was mottled, red and white, and there were scratches on the abdominal wall, the result of irritation. Large veins were seen coursing over the upper part of the abdomen.

The greater part of the abdomen was occupied by a thin-walled cyst, dull on percussion, giving distinct evidence of fluctuation, but no ballottement even in the knee-chest position, which was assumed with difficulty.

* Read at a meeting of the Obstetrical Society of London, February 7th, 1906.



Temperature Chart of Case of Ovariotomy during Labour.

The lower part of the abdomen was occupied by a firm tumour, which was felt more on the right side. This was the pregnant uterus, and could be felt to harden while the upper cystic tumour remained flaccid. The outline of the cystic tumour could not be distinctly felt. The flanks were resonant. The os uteri admitted two fingers. The head presented and was low in the pelvis. Contractions could be felt *per vaginam* from time to time. No part of the tumour could be felt in the pelvis.

The case was diagnosed as a large, and probably ruptured, ovarian cyst complicating labour. It was decided to wait for a few hours until the labour was more advanced: this would also permit careful preparation of the abdomen. I operated at 5 o'clock in the afternoon of August 10th, by opening the abdomen in the middle line above the umbilicus. The tumour was found to be extensively adherent to the abdominal wall in the neighbourhood of the puncture. The wall of the tumour was extremely thin and translucent in places, and had ruptured at the lower part, allowing fluid to escape into the peritoneal cavity. The abdominal incision was enlarged upwards and the omentum was found to be extensively adherent to the upper part of the cyst, requiring several ligatures. Fourteen pints of glairy fluid were collected, but a good deal was lost. The cyst was so thin and soft that it tore readily when seized with forceps. The tumour was a multilocular cyst of the left ovary, and contained no solid growth. The pedicle was tied in two and as a whole with floss silk. Afterwards the ovarian vessels were separately under-stitched, and the peritoneum was drawn over the raw surface with fine silk. The abdomen was flushed with saline fluid. The need of taking every precaution against hæmorrhage from the pedicle was seen during the uterine contractions which rendered the parts very tense. Owing to the shortness of the pedicle the stump had to be cut off nearer the tumour than I like. The wound was closed with deep stitches of silkworm gut, with fascial stitches of fine silk and with silkworm gut for the skin. Sterilized gauze dressing was applied. Strong labour pains had set in an hour before operation. A vaginal examination was now made, and the cervix was found to be fully dilated and the head low down in the pelvis. The forceps was applied, and a living and strong female child, weighing 6 lbs. 10 ozs., was delivered. The child was slightly under the influence of the anæsthetic, but soon breathed. The placenta was expressed a few minutes later. There was no postpartum hæmorrhage. The whole operation, including the forceps delivery, lasted 70 minutes; much of the time was occupied in tying off the adherent omentum.

Mother and child recovered well; the mother suckled her infant. The wound healed by first intention. The lochial discharge ceased on August 20th.

The patient left the hospital on September 6th, with her child, both being very well. I saw them both on October 10th, 1905. The mother's uterus was well involuted, movable, and free from tenderness. The abdominal scar was 2½ inches long and quite sound. The child weighed 10 lbs.

Remarks.

The first point which calls for comment in this case is the tapping to which the patient had been subjected before I saw her. Twelve years ago, in a paper read at the Medical Society of London,* I wrote: "The tapping of ovarian cysts, unless they are undoubtedly malignant, or unless the patient is suffering very acutely from some pulmonary affection or grave general disease independent of the tumour, is in my opinion an unjustifiable procedure." Further experience has strengthened this opinion; but it seems desirable that the opinion of other members of this Society should be enunciated, since in the year 1905 such treatment has been adopted in a lying-in hospital of the Metropolis. I do not anticipate that there will be many Fellows of our Society who will advocate tapping an ovarian cyst complicating pregnancy.

The second point of interest is the line of conduct which should be pursued in the case of a patient in labour who has a large ovarian tumour which does not obstruct the pelvis.

The case is one which needs prompt treatment. The danger of rupture of the tumour, when large, is shown by this case (in which, however, it may have been due to the puncture), and by a case published by me in the *Transactions of the Obstetrical Society of London* (Vol. XLIII., p. 224), where a large tumour spontaneously ruptured with fatal result on the third day after labour. Other similar cases are on record, and go to show the danger of postponing operation, in the case of large tumours, for any considerable time after delivery.

We have three alternatives:—

1. To deliver by the natural passage, dilating the canal if necessary, and then to perform ovariotomy.

2. To perform ovariotomy, and leave the delivery to nature.

3. To perform ovariotomy at the end of the first stage of labour and immediately afterwards to deliver by forceps while the patient is under the anæsthetic; as in the case now recorded. In suitable

* "A first series of fifty ovariotomies," *Med. Soc. Trans.*, Vol. XVII., p. 86.

circumstances the two operations might with advantage be performed simultaneously.

Each of these three methods may properly be performed, and possesses special advantages under particular circumstances—the first in avoiding the injurious effects of the anæsthetic on the fœtus, and facilitating the operation of ovariotomy and the ligation of the pedicle; the second in avoiding the maternal and fœtal injuries which are so common with instrumental deliveries; the third, of which the case here recorded is an example, in that the patient is delivered, without pain, of her child and her tumour with only one administration of the anæsthetic. The ovariotomy can usually be performed with more complete asepsis than just after delivery, and the risk of rupture of the large cyst during the expulsive pains is lessened.

My only other case of ovariotomy during labour I have published *in the Transactions of the Obstetrical Society of London* (Vol. XL., p. 14). In that case the operation was undertaken for an incarcerated ovarian dermoid, with success both in the case of the mother and child.

CRITICAL REVIEW.

The Induction of Premature Labour.

PART II.*

By HERBERT WILLIAMSON, M.A., M.B. (Cantab.), M.R.C.P. (Lond.), *Demonstrator of Obstetrics and Chief Assistant in the Department of Diseases of Women, St. Bartholomew's Hospital; Assistant Obstetric Physician, Royal Waterloo Hospital for Women and Children.*

THE INDICATIONS FOR THE INDUCTION OF PREMATURE LABOUR.

IN opening the discussion upon "Des indications médicales a la provocation de l'accouchement," at the International Congress at Rome, in 1902, Adolphe Pinard urged strongly that the question was one for the physician alone, and that he must act solely upon his own judgment uninfluenced by lawyer or by priest. This view, we believe, is universally accepted in our country, and whilst the moral, the religious, and the legal aspects of the question have in the past occupied an important place in the writing of obstetricians, to-day when we attempt to review the subject we may assume that it is justifiable to terminate a pregnancy whenever its continuance would endanger the life of the pregnant woman. But whilst the principle is tacitly recognized by all recent writers, there is still wide divergence of opinion as to the precise conditions under which it may be advisable to terminate a pregnancy.

The conditions which may justify the induction of premature labour naturally group themselves into certain well-marked classes. We may perform the operation as a prophylactic measure where there is mechanical disproportion between the size of the pelvic canal and that of the fœtus, or, on the other hand, as a means of rescue from danger where the mother is suffering from some disease which originated in or became aggravated by her pregnancy. We may therefore divide our cases into two main groups:—

1. In which the induction of premature labour is undertaken primarily in the interests of the child.

* Part I. appeared in the JOURNAL for October, 1905, p. 252.

2. In which the operation is performed in the interests of the mother.

In group 1 we shall consider three separate conditions:—

(*a*) Cases in which the pelvis is of normal size, but the fœtus attains an unusual degree of development.

(*b*) Cases in which death of the fœtus occurs habitually in the later weeks of gestation.

(*c*) Cases of contracted pelvis.

From this classification we intentionally omit pregnancy complicated by pelvic tumours, such tumours whether innocent or malignant, whether growing from the ovary, the uterus, or the pelvic walls, may cause obstruction during delivery; there is, however, amongst obstetricians an almost unanimous consensus of opinion that in these cases the induction of premature labour has no legitimate place as a mode of delivery, and that the interests of both mother and child are best served by other methods of treatment.

Group 2 may be sub-divided into two main divisions:—

(*a*) *Where the life of the mother is endangered, or where acute symptoms have arisen, as the result of some pathological condition which depends solely upon the pregnancy.*

(1) The toxæmia of pregnancy.

(2) Chorea gravidarum.

(3) Uterine hæmorrhages.

(4) Hydramnios.

(5) The pyuria of pregnancy.

(*b*) *Where some pre-existing disease is aggravated by the accident of pregnancy.*

(1) Diseases of the circulatory system.

(2) Diseases of the respiratory system.

(3) Diseases of the urinary system.

(4) Certain general diseases.

Group I.

(*a*) *Cases in which the fœtus is of unusually large size.*

Children delivered at full term differ widely from one another in the size and weight which they have attained, and in the degree to which the head is capable of responding to the forces which tend to mould it. Upon what conditions these differences depend we as yet have little knowledge: very wide variations occur within the limits we regard as normal; occasionally, however, we meet with women whose children attain so large a size before birth that even if the pelvis be of average dimensions, delivery of a full-term living

child, *per vias naturales*, becomes an impossibility. Hamilton, formerly Professor of Obstetrics in the University of Edinburgh, was acquainted with such cases, and he speaks of women who at full-term habitually gave birth to children weighing from ten to fifteen pounds. There can be little doubt that some of these cases of abnormal development depend upon a protraction of the period of gestation. We recently delivered a patient at the end of ten calendar months' gestation of a child weighing eleven and a half pounds. Fœtal movement had not been felt for a week before delivery, and at the time of its birth the child had evidently been dead for some days It is our intention, should this patient again become pregnant, to induce labour as soon as the full period of gestation is reached.

All the authors we have consulted admit the advisability of the induction of premature labour in these cases; some few, however, as, for instance, Edgar, have somewhat modified their opinion since the publication of Prochownik's papers.

Prochownik claims that the weight and size of the fœtus and the degree of ossification of its cranial bones may be very materially influenced by carefully dieting the mother during the last six weeks of her pregnancy. He has tabulated the results of a considerable number of cases in which this treatment has been adopted; all the children were born alive, although amongst the mothers there had been previously many instances of still-birth. The majority of the children were lean at birth, the skin of the head was lax, and the cranial bones exhibited a notable degree of mobility upon one another. It is possible that this treatment may provide an alternative to the induction of premature labour in the class of case to which we are referring; but, as far as we are aware, although his paper was published in 1889, no other workers have confirmed Prochownik's results, nor is this surprising, when we remember how common a thing it is for weakly, emaciated women to produce healthy, fat babies. This class of case furnishes one of the very few instances in which there is practically unanimous agreement that induction of premature labour is the proper treatment; there is also an almost universal consensus of opinion that the best method of procedure is that of Krause.

(*b*) *Habitual death of the fœtus.*

Since the time of Denman it has been recognized that there are some women who conceive readily and proceed regularly in their pregnancy until within a few weeks of the full-term of gestation, when fœtal movements cease, and within a few days, or, in some

instances, weeks, delivery of a dead child results. Our knowledge of ante-natal pathology is still scanty, but recent advances have taught us clearly that these cases do not all belong to the same category. We may recognize two groups: in the one there is a syphilitic taint in the mother, or, more rarely, in the father, and syphilitic lesions are sometimes demonstrable in the placenta; in the other no such cause can be assigned, the fœtus dies and is expelled, but no lesion to account for its death can be found. All recent writers admit habitual death of the fœtus as an indication for the induction of premature labour, but, whilst some apply the treatment to both groups of cases, others would limit its application to the second group. Thus Whitridge Williams writes: "In rare cases of habitual death of the fœtus in the later months of pregnancy, when not due to syphilis or renal disease, the induction of premature labour has been recommended at a time slightly anterior to that at which the fœtal death occurred in previous pregnancies, in the hope that a living child may be obtained. In such cases the operation may be undertaken if the parents are extremely anxious for a living child, although in no instance should a positive assurance of success be held out to them." A. R. Simpson does not consider syphilis a contra-indication to the operation, and at the International Congress at Rome, in 1902, spoke as follows: "I have myself induced premature labour in the eighth month in a lady who had previously lost six fœtuses between the sixth and ninth month from syphilitic placentitis, with the result that a living child was born. The placenta in the seventh pregnancy was also undergoing degeneration, which would have led to the death of the infant if it had been allowed to go on longer. The boy was delicate and difficult to rear, showing in a tendency to sore throat and glandular swellings a syphilitic taint of system which he ultimately out-grew, so that when he came of age, a year or two ago, he entered on the possession of a good estate in the Western Highlands. For me, therefore, the death of a succession of infants towards the close of pregnancy forms a perfectly fair indication for induction of premature labour in a woman with a subsequent living child approaching the same deadly epoch."

We must believe that the immediate cause of death in these cases is an inability on the part of the mother to furnish the fœtus with certain materials which are necessary for its continued existence, or possibly that the placenta is incapable of fulfilling for a further period its function as an organ of excretion. Should either of these hypotheses be correct, induction of premature labour would be the

logical treatment. In cases of syphilitic infection we must bear in mind a third possibility in the presence of a toxine, and we must enquire into the effects of a course of mercury and iodide of potassium administered throughout the pregnancy. We have lately observed in the out-patient room of the Royal Waterloo Hospital a case which bears closely upon this point. The patient acquired syphilis almost immediately after her marriage, and during the course of the next four years bore three children, all of whom were born dead at the end of the eighth month of gestation. When first seen she was three months pregnant; during the next five months she was treated continuously with small doses of mercury and iodide of potassium, but in spite of this, delivery of a dead child occurred at the eighth month. Three months later she again became pregnant; the same treatment was pursued, but labour was induced at the end of the thirty-second week, and she was delivered of a healthy child, which up to the present time has exhibited no syphilitic taint. One case of this kind furnishes no data for dogmatic statement; but it has influenced us materially in believing that induction of premature labour should be practised in this group of cases even when a syphilitic taint exists.

(*c*) *Induction of premature labour in cases of pelvic contraction.*

There is probably no subject in the whole range of obstetrics which at the present day is more hotly debated, or upon which opinion is more divided, than the treatment of labour complicated by pelvic contraction. A generation ago the question was a comparatively simple one; at that time induction of premature labour was the only method which combined a fair degree of safety to the mother with a reasonable chance of live birth for the child. But the times have changed, and to-day distinguished obstetricians from many different schools have raised their voice in protest against the procedure.

What has led to this change of opinion? Undoubtedly the most important factors have been the advances made in obstetrical surgery. Cæsarean section, an operation formerly fraught with the gravest danger, and undertaken only in desperate cases, is now a safe and reliable method of delivery. By this we do not intend to imply that its dangers are no greater than those of natural delivery; Cæsarean section under the most favourable circumstances, and in the most competent hands, has still a mortality far greater than that of normal labour, or of labour induced prematurely; under unfavourable conditions and in the hands of those who are seldom

called upon to perform abdominal operations, its mortality is still comparatively high.

We must remember, further, that in cases of contracted pelvis, whatever operation may be undertaken, is undertaken primarily in the interests of the child, and that whilst there are available many tables of statistics from which we may gauge the results to the mothers, the records furnish only very imperfect data when we endeavour to ascertain the fate of the children.

It is necessary, therefore, to enquire carefully into the history of infants delivered by Cæsarean section. The results of such enquiry lead to the conclusion that Cæsarean section is attended by a high fœtal mortality; when, however, the cases are studied in detail it becomes evident that many of the infants died, not because Cæsarean section was performed, but because it was not performed sooner. In some instances the child was dead before the operation was undertaken; in others labour had lingered on for many hours, and the rate of beat of the fœtal heart had become dangerously low. If, however, we exclude all but the most favourable cases we find that at the lowest possible estimate more than 7 per cent. of the infants do not survive the first week of extra-uterine life. We have been unable to find any careful study of the infant mortality: too often in the recorded cases the fate of the child is not stated; but this aspect of the question is one which is well worthy of our most careful attention. What the causes of this mortality may be we are not prepared to state; in some cases, clearly, injuries during delivery were responsible; in others this cause could not be assigned. But the fact remains that under present conditions the fœtal mortality of Cæsarean section is considerably higher than that of natural delivery.

We have only recently realized the possibility of repeated Cæsarean section upon the same patient. The knowledge that women have on several occasions been delivered by this method of a full-term child in as many as three or four consecutive pregnancies must influence us materially in our treatment; when, as until recently, it was considered advisable to sterilize every woman upon whom Cæsarean section had been performed, it was natural, if a successful issue were possible by this means, to choose in preference the induction of premature labour.

Wallace, in his admirable paper, records sixty-one instances in which the operation was performed on the same patient more than once; the maternal mortality was between 7 and 8 per cent.; the fœtal mortality is more doubtful; if we consider the forty-six cases

of which abstracts are given, in eleven the fate of the child is not mentioned. Of the thirty-five remaining cases the fœtal mortality within the first month of life is 14 per cent. From a study of these and similar statistics we must conclude that for the more severe degrees of pelvic contraction this method of delivery gives the most satisfactory results we have yet been able to attain; but for the slighter degrees infinitely more happy issues attend the induction of premature labour.

To what extent has the revival of the operation of symphysiotomy altered our views? This operation has never been popular in England, and the cases recorded by English obstetricians are singularly few; on the continent and in America its advocates are many. Amongst the most powerful of these is Pinard. He states that in his experience the infantile mortality which has attended the induction of premature labour is 30 per cent., and that many of the survivors never develop into strong healthy children; he maintains that the object of every obstetrician should be to bring each pregnancy to term and to effect delivery with a minimum of traumatism to the mother and the child; and concludes that this view contra-indicates the induction of premature labour in cases of contracted pelvis. Pinard here speaks of the results of induction of premature labour taken as a whole; but this is surely a misleading presentation of the question; the results of induction of premature labour depend upon the conditions for which the operation is undertaken, and in cases of contracted pelvis upon the size of the conjugate and the variety of pelvis with which we have to deal.

This is clearly shown in Bar's statistics of 100 cases in which he induced premature labour:—

In pelves with a conjugate of			6–7	cm.	the	fœtal	mortality	was 80%.
„	„	„	7–8	„	„	„	„	53%.
„	„	„	8–9	„	„	„	„	12%.
„	„	„	9–10	„	„	„	„	8·6%.
„	„	„	over 10	„	„	„	„	nil.

To speak of the fœtal mortality of the operation as 30 per cent. is to ignore entirely the principles which should guide us in selecting this form of treatment; if statistics have any value whatever they tell us clearly and unmistakably that in the graver degrees of pelvic contraction there are better methods of delivery, but they tell us no less clearly that in the slighter grades we have at present no method equal to this. What of the alternative which Pinard

would have us practise—the operation of symphysiotomy? In Pinard's own hands this operation has a mortality of between 10 and 12 per cent. for both mother and child. If this mortality cannot be reduced we must conclude that the operation was scarcely justifiable; by a careful selection of cases, however, better results have been obtained. Bar has performed the operation twenty-five times; all the mothers and all the infants survived. He attributes Pinard's high mortality to the fact that some of the women were exhausted or infected before the operation was performed, and considers that it is contra-indicated by the presence of such conditions as pyrexia, a quick pulse, or fœtid amniotic fluid. In spite of his brilliant results with symphysiotomy, Bar is an advocate for the induction of premature labour in cases of the slighter degrees of pelvic contraction. It is a very difficult matter to estimate accurately the size of the fœtal head and the size of the pelvis; with both these factors accurately known there are cases, doubtless, in which symphysiotomy would be the ideal method of delivery; but with the uncertainty which in the present state of our knowledge must enshroud both these factors, most English obstetricians, wisely, as we believe, prefer to adopt one or other of the alternative methods—induction of premature labour or Cæsarean section.

From what has been said previously it will be quite clear that it is the high fœtal mortality which has led obstetricians to abandon to a considerable extent this proceedure, and we shall presently adduce evidence to show that this high fœtal mortality occurs only in cases of considerable degrees of pelvic contraction; in such cases we believe Cæsarean section to be the proper treatment, but there still remains a group of cases—one which contains the great majority of all contracted pelves—in which we believe the induction of premature labour offers the best chance both to mother and child—this group includes generally contracted pelves with a conjugate of 8 to 9·5 cm., flat pelves with a conjugate of 7·5 to 9·5 cm.

That patients with pelves of these dimensions are sometimes delivered spontaneously at full term is a matter of common knowledge, and doubtless premature labour has often been induced quite unnecessarily when a routine mode of treatment has been adopted. But if each case be considered upon its own merits and a careful estimate of the proportion of the size of the fœtal head to that of the pelvic brim be made at weekly intervals during the later weeks of gestation, in the practice of a competent obstetrician such mistakes will be few.

We have stated that the induction of premature labour in cases

of contracted pelvis is undertaken primarily in the interests of the child, and it is by its results, viewed from this standpoint, that the operation must stand or fall. At the same time we must be influenced to some extent by the fact that in the hands of one who understands and practises surgical cleanliness the maternal mortality is no greater than that of normal labour, and that this can be said of none of the other modes of delivery which have been proposed as substitutes.

What stage of gestation must be reached before the fœtus becomes viable? Brouzet and Van Swieten have shown that fœtuses born during the 20th or 21st week may occasionally survive, and, under favourable conditions, live to old age; in one case recorded by Van Swieten the age of 79 years was recorded. We have under observation at the present time a child of three years of age, healthy and well-developed, who was born in the 24th week of gestation; at its birth it weighed only 3½ lbs. Such cases are, however, exceptional; daily experience shows that, as a rule, fœtuses born before the 28th week do not grow up, and, according to Bar, amongst fœtuses delivered at this period the mortality is 80 per cent. After this period the chances of the child's survival increase in almost geometrical proportion with each additional week of gestation; at the 30th week the mortality is about 50 per cent., and by the 33rd week it has fallen to 12 per cent. It will be remembered that Wallace's statistics for repeated Cæsarean section showed a fœtal mortality of 14 per cent., and a maternal mortality of 8 per cent. Given then a pelvis of such a size that gestation may be allowed to continue to the 33rd week these statistics show that the induction of premature labour offers a rather better chance for the child, and gives an infinitely better prognosis for the mother than the performance of Cæsarean section; if, however, the degree of pelvic contraction be so great that it is impossible for a child of average dimensions to be born spontaneously at the 32nd or 33rd week, the most satisfactory result will usually be obtained by Cæsarean section.

We attach considerable importance to the word "spontaneously" in the previous sentence. In looking up the records of cases at St. Bartholomew's and Queen Charlotte's Hospitals we have been struck by the high fœtal mortality which, in the case of premature children, has attended both difficult forceps deliveries and podalic version. To delay the induction so long as to necessitate either of these modes of delivery is almost to court disaster; with full-time children both these operations have a considerable mortality; with premature children they have a mortality which is appallingly high.

Here, then, as it seems to us, we meet with the limits of utility of the operation of the induction of labour, if thirty-two weeks of intra-uterine life have not been completed, the operation should not be practised except under exceptional circumstances; our further enquiries must, therefore, be directed towards ascertaining as far as possible what degrees of pelvic contraction allow us to fulfil this condition. We realize at once that no hard and fast line can be laid down: we cannot say, for instance, that in flat pelvis a conjugate of X cm. will allow the passage of a fœtus which has attained a development corresponding to Y weeks of gestation, nor can we in any given case foretell precisely at what period it may be necessary to induce labour.

We can never during life accurately measure a pelvis in all its dimensions, and, even if we could, we should ascertain one factor only: the exact dimensions of the fœtal head, and the degree of moulding possible would still be unknown to us.

Every case must be considered on its own merits, and only by estimating as accurately as we can the proportion between the size of the head and the size of the pelvis can the psychological moment for the induction of labour be ascertained. Nevertheless, many obstetricians have indicated the degrees of pelvic contraction which they regard as the limits of utility of this operation. Dohrn would induce premature labour in flat pelves with a true conjugate of 7·5—8·5 cm., and in generally contracted pelves with a true conjugate of 8·9 cm.; Fehling in pelves with a true conjugate of 7·9 cm. V. Herff distinguishes between primiparæ and multiparæ; in primiparæ he would induce labour in cases of flat pelvis with a conjugate of 7·25 to 8·75 cm., and in generally contracted pelves with a conjugate of 8 cm. and upwards; in multiparæ, in flat pelves with a conjugate of 7·5 to 8·5 cm.

Kaltenbach takes as his limits a conjugate of 7·5 to 8·5 cm. in flat pelves, and 8·9 cm. in generally contracted pelves.

Kehrer induces labour in cases of flat pelves with a true conjugate of 7·5 to 8·5 cm., and small round pelves with a conjugate of 8 to 9 cm.

Leopold takes as his lowest limit a conjugate of 7 cm. in flat, and 7·5 cm. in small round pelves.

Litzmann gives as his indications, flat pelves with a true conjugate of 7·4 to 8·2 cm., and generally contracted pelves with a true conjugate of 8·75 cm.

Schauta induces labour in flat pelves with a conjugate of between

7·5 and 8·5 cm., and in small round pelves with a conjugate between 8 and 9 cm.

Olshausen and Veit give as their lowest limit a conjugate of 6·75 cm.

Schröder considers induction the proper treatment in pelves with a conjugate between 6·5 and 9·75 cm.

If, however, we practise as a routine treatment the induction of premature labour in all pelves with a conjugate between 7 and 9 cm., we shall perform the operation in many cases in which it is quite unnecessary; this fact is brought out very clearly in the statistics from the Leipzic clinic published by Krönig and Zweifel. These authors have studied the course of labour in 726 cases of contracted pelvis. In the great majority of these the conjugate measured between 7 and 9·5 cm. 504 of these were flat pelves, 222 of the generally contracted variety. Labour was allowed to take its natural course, and it was found that in the flat pelves with a conjugate between 7 and 8·5 cm. assistance in delivery was required in only 16 per cent. of the primiparæ, but in a considerably larger proportion of multiparæ; where the conjugate was between 8·5 and 9·5 cm. assistance was required in only 2·7 per cent. of the cases. In the generally contracted pelves with a conjugate between 7·5 and 8·5 cm. assistance was required in 16 per cent. of the cases; where the conjugate was above 8·5 cm. delivery was nearly always completed spontaneously. In this series of 726 cases of contracted pelvis, labour was reported to be "normal" in 91 per cent. Many of these "normal" labours were, however, long and difficult, and 44 of the children were still-born; in the 64 cases where forceps delivery version or craniotomy was employed, only 25 of the children survived, whilst 39 were either still-born or died within a few days of birth. Commenting upon these results, Norris writes:—

"Many, perhaps almost all, of those lost in their passage through the conjugates below 8 cm. could doubtless have been saved by Cæsarean section, and I believe it is equally true that almost all of those lost in passing through the conjugate above 8 cm. could have been saved by the induction of premature labour."

We have already pointed out that the tendency in the past has been to induce premature labour in cases which were totally unsuitable because of high degrees of pelvic contraction, and that, on the other hand, induction has been practised in many cases in which it was quite unnecessary. It is, in our opinion, the failure on the part of practitioners to recognize its limits which has led to a swing of the pendulum in the opposite direction, and has caused some

recent writers to deprecate the operation unduly; a true conception of its value can only be reached when we cease to speak in general terms of the infant mortality of the induction of premature labour as a whole, and begin to speak of the mortality when labour is induced at definite weeks of gestation. Let us illustrate this point by a quotation from Whitridge Williams:—

"A survey of the literature shows that the primary fœtal mortality is not always the same, the results of different operators varying from 12 to 45 per cent. Kleinwächter, in the last edition of his monograph upon the interruption of pregnancy, placed it at 21·7 per cent., which, however, became increased to 39·6 per cent. before the children were discharged from hospital."

We would here point out a fact which Williams fails to make clear: that this difference of mortality between 12 and 45 per cent. depends not upon the methods of the individual operator, but upon the period of gestation at which he has performed the operation. "Moreover," Williams continues, "this does not represent the ultimate result, as it must be borne in mind that premature children require an amount of care and skilful nursing which is rarely available in the houses of the poor; and that, therefore, one can obtain an accurate idea of the value of the operation only by estimating the number of children who survive the first year; and I do not think one will go far wrong in calculating that not more than one-third survive that period." This gloomy view is probably justified in the case of children born in the 28th or 29th week of gestation; but we shall show presently that it is totally inaccurate when applied to children born after the 32nd week. It is, however, on grounds such as these that Williams bases his conclusions:—"This appears to me to be a very poor showing, and if the operation is to be undertaken solely in the interests of the child it would seem that the results obtained differ only in degree from those following the induction of abortion at an early period of pregnancy. Moreover, it would appear probable that in many instances the operation is performed unnecessarily, since experience teaches that about 70 per cent. of all labours occurring within this category end spontaneously. Accordingly, admitting for the sake of argument, what is by no means the case, that the remaining 30 per cent. would result in dead-born children, one would have a fœtal mortality hardly exceeding that which is admitted by the advocates of premature labour. But even if all operative cases ended fatally, the failure to induce premature labour would appear justifiable, as the 70 per cent. of children which were delivered spontaneously would be fully developed and

thus much better able to cope with the dangers of the first year of life than a similar number of premature children.

"Acting upon this belief, I have never thought it necessary in my work to resort to the induction of premature labour in contracted pelves, but have allowed my patients to go to term and to fall into labour spontaneously, conducting the case under the most rigid aseptic precautions, and making vaginal examinations only when urgently indicated. The patient is allowed to enter the second stage and if at the end of two hours, in spite of good pains, the head shows no signs of engaging, and the child and mother are both in good condition and under suitable surroundings, Cæsarean section is at once resorted to. This, however, is rarely necessary, as, in the vast majority of the cases, before the expiration of this period, the head shows signs of moulding and adapts itself to the pelvic inlet, so that labour occurs after a longer or shorter period, or, at the most, can be effected by a high or mid-forceps operation."

Only few writers have followed carefully, during a period of several years, the life history of the children born prematurely as the result of the induction of labour. A research conducted on these lines would be of the highest value; such an undertaking offers almost insuperable difficulties amongst hospital patients, and it is only in private practice that prolonged observation is possible. Every obstetrician can, amongst his own patients, point to cases which are to him a source of lively and continued satisfaction. If these individual experiences could be collected and classified, information of the highest value would become available. Norris, of Philadelphia, has carefully traced his cases, and has given us his experiences; an example which we hope may be largely followed. Norris has published a full account of thirty cases, giving the history of previous labours, the variety of pelvis, the dimensions of the true conjugate, the stage of gestation at which labour was induced, the method of delivery, the immediate result to both mother and child, and the present condition of such infants as survived. We will quote his general conclusions:—

"An analysis of the appended tables shows that in thirty cases of induced labour for the lesser degrees of pelvic contraction there was neither maternal mortality nor morbidity. Twenty-three of the children are living and well at the present time, some of them nine and ten years of age. Seven infants died. Two were still-born; one from craniotomy after version, the occiput rotating backward with the chin impacted above the symphysis. This case was delivered at term after the induction of labour by my assistant during

my summer vacation, and might have been saved even at term if the backward rotation and impaction had been prevented, as I have always been able to do in similar cases. The conjugate was $8\frac{1}{2}$ cm.; the infant weighed 7 pounds. The other still-born infant was the result of a prolapsed cord, pulseless when the accident was discovered, and after delivery disclosed a large spina bifida incompatible with life. Two infants died from prematurity, the result of too early interruption of pregnancy. These two deaths and the prolapsed cord give the fair mortality of induced labour, in this group of cases, of 10 per cent. The death from prolapsed cord might have been prevented by earlier recognition, and is one of the disadvantages of avoiding frequent examinations in the conduct of labour, which, however, has always been my practice. Prolapse of the cord is certainly a rare complication, having occurred in less than 1 per cent. in my experience. One infant died on the fifteenth day from infection of the navel; one on the third day, having been previously well, from a sudden and rapidly fatal intra-peritoneal hæmorrhage *(autopsy)*; one on the fifth day from aspiration pneumonia (an easy low forceps operation). Neither of these deaths can be fairly attributed to the induced labour. If I, or anyone else, had elected to do Cæsarean section on these thirty cases in hospital and private practice, is it likely that the ultimate results would be better as regards maternal and fœtal mortality and morbidity? Ten per cent. primary fœtal mortality, seventy-seven per cent. of the children living to-day from two to ten years of age. Cæsarean section would have occasioned greater notoriety, but not greater satisfaction to an earnest student of practical obstetrics."

Here then we see the other side of the shield; this series of cases, as Norris admits, contains two cases (both fatal to the children), in which the induction of premature labour was an error of judgement, but even if we include these cases seventy-seven per cent. of the children are alive and well at periods of from two to ten years after operation.

Such then is the present position of this difficult question: on the one hand, Pinard, Zweifel, Whitridge Williams, and others hold that this operation should have no place as a routine in cases of pregnancy complicated by contracted pelvis; Leopold, Schauta, Schröder, Veit, and Olshausen maintain that it offers still the greatest security to both mother and child, provided its proper limits be observed. With this latter view we entirely agree; both our reading and our personal experience with the operation have convinced us of its utility.

GROUP II.

(1) THE TOXÆMIA OF PREGNANCY.

Under this heading are grouped together conditions which differ widely in their clinical manifestations, but which possess certain features in common and exhibit similar pathological lesions. The lesions found post mortem are so distinctive and so constant, that we are compelled to regard this group of cases as constituting a definite clinical entity.

At the present time cases of the toxæmia of pregnancy are divided by most authors into four separate classes:—

1. The toxic albuminuria of pregnancy.
2. The pernicious vomiting of pregnancy.
3. Eclampsia.
4. Icterus gravis gravidarum.

The pathology is still obscure; but to those who have followed closely the results of recent research, it becomes more and more evident that the various clinical phenomena exhibited by these patients are the result of some toxic substance or substances circulating in the blood of the pregnant woman. What is the nature of these toxines; whether they are produced as the result of disordered fœtal or maternal metabolism, whether they are produced by the placenta, or are of bacterial origin, no one, as yet, has been able to ascertain.

Where we know so little of the cause of a disease, our treatment is bound to be empirical; but where a condition is so clearly associated with pregnancy, it becomes a matter of great importance to enquire in what way artificial termination of pregnancy affects the patient.

Although most authors agree as to the toxic nature of the various conditions we have enumerated, it must not be supposed that they are universally regarded as different manifestations of one and the same toxæmia. Thus, Whitridge Williams writes (*Lancet*, Oct. 21st, 1905, p. 1,172):—"My experience has taught me that there are at least two toxæmias of pregnancy, and probably more: one giving rise to the vomiting of pregnancy and acute yellow atrophy, and the other to eclampsia. This conviction is founded upon careful study of the pathological anatomy, clinical observation, and metabolism in these two conditions. In both necrotic lesions appear in the liver . . . . but in eclampsia the lesions begin in the portal spaces and invade the lobule from the periphery, while in the vomiting of pregnancy the necrosis begins in the centre of the lobule, spreads peripherally, and never invades the portal spaces. . . . Clinical examination of the

urine shows an equally marked contrast between the two conditions. In eclampsia, the total amount of nitrogen is greatly diminished, while the ammonia coefficient remains practically normal. In vomiting, on the contrary, in spite of the scanty amount of urine, the amount of total nitrogen remains approximately normal, while the ammonia coefficient is wonderfully elevated."

Albuminuria of pregnancy. It is in these cases that we meet with the milder manifestations of the toxæmia of pregnancy, manifestations which are too often but a shadow of that which is to come. A little œdema of the legs, a trace of albumen in the urine, headache, perhaps some dimness of vision—this train of symptoms occurring in a patient not previously the subject of renal disease, may be the herald of one of these grave conditions of which we shall presently speak. These symptoms are not necessarily an indication for the induction of labour; but, if the patient be put under the most favourable conditions, be kept in bed, be carefully dieted, be freely purged, and no amelioration of the symptoms results, the case is one for the induction of labour. In the majority of cases, if treated on the lines we have laid down, this procedure will not be called for; in a minority it will be necessary. Pinard's statement of the case can hardly be improved upon: —

"When, as occasionally happens, a pregnant woman whose urine contains albumen, is treated rigorously with no diminution of the quantity of albumen, when restlessness and sleeplessness become manifest, when headache and visual troubles arise; when the act of respiration is modified, I find in this train of symptoms a sufficient indication. But, I repeat, this indication is extremely rare, when the patient is submitted to a course of treatment strictly applied."

Pernicious vomiting. This condition is usually seen in the earlier months of pregnancy, but occasionally leads to a fatal result during the eighth or ninth month. A case of this kind was quoted by A. R. Simpson at the International Congress of 1902. When it is once ascertained beyond doubt that the vomiting depends upon a condition of toxæmia, there can be no question as to the propriety of terminating the pregnancy. Vomiting, however, may depend upon other conditions, such as nervous or gastric disturbance, in which, by judicious treatment, a happy issue may be expected. What are we to take as indications? Pinard relies solely upon the clinical aspect of the case. He writes: "What I observe with the greatest care is the pulse. After numerous observations, I have been led to conclude that if, in the case of a woman suffering from uncontrollable, or better, toxic vomiting, there is an increase in the pulse rate such

that the number of beats per minute rises to more than 100, it is necessary forthwith to interrupt the pregnancy. If we delay, our intervention will be useless, for death will follow, caused by a poisoning of the nervous system."

Whitridge Williams, in a recent paper, suggested that the chemical examination of the urine offers a more reliable test. Speaking of these cases of pernicious vomiting, he says:—

"Associated with these lesions is a striking change in metabolism, which is manifested by a marked increase in the percentage of nitrogen put out as ammonia, compared with the total nitrogen of the urine, so that the former, instead of being 3 to 5 per cent., as normal, may rise to 16·31, or even 46, per cent., as in several of our cases. Whether this increased ammonia coefficient is due to the fact that the marked destruction of liver tissue interferes with the oxidation of nitrogenous material so that large amounts escape conversion into urea, and are therefore excreted in a less highly oxidised form as ammonia . . . . is as yet undecided. . . . The practical outcome of my experience is, that a marked increase in the ammonia coefficient in women suffering from pernicious vomiting indicates the existence of a serious toxæmia, which, if allowed to continue, will be found to be accompanied by lesions of the liver and other organs inconsistent with life. Accordingly, in such conditions, abortion should be induced as soon as the condition is detected, as it offers the only hope of checking the toxæmia and saving the life of the patient. My experience has not been sufficiently extended for me to lay down definite rules as to how great an elevation in the ammonia coefficient is consistent with the safe continuance of pregnancy. But, until further experience demonstrates the contrary, it would seem safe to assume that an ammonia coefficient of 10 per cent. represents the danger signal, and as soon as it is reached immediate interference is demanded."

It is too early to pronounce an opinion upon the value of a rise in the ammonia coefficient as an indication for the induction of labour; it has not yet been tested in a sufficiently large series of cases.

Eclampsia. In 1904, Dr. Comyns Berkeley submitted to most of those engaged in teaching obstetrics in the medical schools of this country a number of questions concerning the treatment of eclampsia. Amongst the questions submitted was this:—

"In a woman suffering from eclampsia and not in labour, would you or would you not induce?" To this question twenty-eight answers were received; fourteen in the affirmative, fourteen in the

negative. With such an equal division of opinion amongst British teachers, we turn with considerable interest to the opinions expressed abroad. Let us consider the opinions expressed at the International Congress of 1902. First, Pinard asked the question: "When toxæmia produces convulsions in a pregnant woman, ought we to interrupt the pregnancy?" He answered as follows: "This question, though asked long since, cannot to-day be regarded as settled. Perhaps, and I hope so, evidence may be brought forward at this conference which will enable us to answer it finally. But I can only repeat what I said at the congress at Nantes last year . . . . on the value of intervention in cases of eclampsia. I have only a relative confidence in this treatment. I have employed it in a case with success, but the symptoms observed were exceptional. . . . I consider that, except under unusual circumstances, the necessity for the interruption of pregnancy in a woman the subject of eclampsia is not sufficiently demonstrated. My colleague, Professor Queirel, states that he agrees entirely with this opinion." Hofmeier, who spoke next, said, "In cases of the kidney of pregnancy (*rein gravidique*), the danger of eclampsia calls for the artificial termination of pregnancy when, in spite of suitable dietetic treatment, the symptoms continue or become more severe."

Rein, of St. Petersburg, referred to certain cases of eclampsia in which he had interfered; but did not mention the indications which led him to do so.

Schauta said: "In mild cases of eclampsia, therapeutic treatment, with the administration of morphia and a milk diet, should be tried first; if this treatment is not successful, if the fits are repeated, or where coma supervenes, the pregnancy must be interrupted."

From this brief review it is clear that there is no authoritative ruling on this difficult question. If our view, that eclampsia is due to a toxine which is the direct result of pregnancy, be correct, it would seem only natural to terminate the pregnancy as quickly as may be without adopting methods which involve an undue risk to the mother; but, on the other hand, we must remember that some patients who suffer from eclampsia at the sixth or seventh month recover and are delivered at full term of living children. The truth is, that our knowledge is so incomplete that we can lay down only tentative rules for treatment, and that, at present, we have no reliable tests which we may apply to ascertain in a given case whether it is or is not necessary to terminate the pregnancy.

Icterus gravidarum is a rare condition, and its literature is only

scanty. As far as our researches have gone, we have found a universal consensus of opinion that pregnancy should be interrupted as soon as the condition is diagnosed.

(2) Chorea of Pregnancy.

Three papers have been published recently upon the chorea of pregnancy; in these papers the indications for the induction of premature labour are discussed. The first of the series appeared in the *Monats. für Geburts. und Gynäk.* for January, 1903. The writer, Hirschl, from the study of a considerable number of cases, concludes that, in spite of all forms of medical treatment, some cases grow progressively worse, and in these the advisability of the induction of premature labour must be considered. The signs of greatest importance are not the violent movements, but the effect which the movements have upon the patients. If there be loss of sleep, progressive emaciation from the difficulty of feeding, and occasional rise of temperature, the gravity of the case increases from day to day. It is useless to put off the induction of labour in the interest of the fœtus, because, even in mild cases, 40 per cent. of the infants are born dead. An attempt may first be made to stop the choreiform movements by simple dilatation of the cervix; if this procedure produces no effect, then delivery must be proceeded with.

Sir Dyce Duckworth treats the subject from the point of view of the general physician. In a valuable paper published in the St. Bartholomew's Hospital Reports for 1903, he says: "I believe the induction of labour to be advisable in cases of chorea gravidarum under the following conditions, and I should urge the practice of it accordingly:—

(1) When the movements are violent and are hardly, if at all, influenced by treatment with salicylates, bromides, chloral, or paraldehyde, employed in such doses as are safe to administer during pregnancy. (2) When with incessant movements and absence of sleep mental delusions set in and proper feeding becomes difficult or impossible. The operation should not be delayed too long. The existence of cardiac valvular disease should not be regarded as a cause for declining to induce abortion, although it is an unfavourable complication. It is probably advisable not to induce labour hurriedly, but to arouse the uterus gradually to its normal expellant energy. By attention to these points it may be fairly hoped that the ratio of mortality hitherto prevailing under these conditions will be materially lessened in the future."

The third paper was read by Andrews and Wall before the Medical Society of London, in 1903. In discussing the value of the induction of labour, they remarked: "In the cases collected by Buist, spontaneous abortion and premature labour were followed by death in 33 per cent.; induced abortion and premature labour were followed by death in no less than 43 per cent. of the cases. At least five of the nine fatal cases of induction died of sepsis. Amongst our own cases abortion was induced three times. Two of the three patients died. Since 1895 abortion has not been induced for chorea at the London Hospital. . . . It is probable that the mortality after induction of labour will be diminished by more careful antisepsis; but, even if this be granted, we contend that this method of treatment is seldom needed and frequently fails to save life. As indicated above, we do not consider that mania can in itself be considered an indication for the induction of abortion."

We cannot entirely agree with the conclusions reached by these last authors; we are convinced that where proper antiseptic precautions are employed, the mortality of the induction of labour is not nearly so high as the figures quoted by them would indicate; further, of its value as a life-saving operation in those cases where a course of treatment by rest, by diet, and by drugs, has failed to bring about an alleviation of the symptoms, we have no doubt. We watched throughout its course the case quoted by Duckworth, and in a patient almost moribund; the improvement within twenty-four hours of delivery was most striking. We believe that in severe cases of chorea, in the interests of the patient, the operation is demanded.

(γ) *Uterine hæmorrhage.* That in certain cases uterine hæmorrhage constitutes a clear and urgent indication for the induction of labour, may be taken as an axiom. The questions which demand an answer are—(1) under what condition does the hæmorrhage endanger the life of a pregnant woman? and (2) what are the symptoms which constitute a precise indication for the interruption of pregnancy? Pinard says: "I consider that simply ascertaining the loss of a large quantity of blood, important as this is, does not constitute sufficient indication for the interruption of pregnancy. Paleness of the skin, singing in the ears, tendency to faintness; these things, presenting as they do an alarming picture, only constitute an indication for operative interference if, added to this train of symptoms, there is an acceleration of the pulse-rate so marked that the number of beats per minute is constantly above a hundred. For my part, whatever may be the quantity of the hæmorrhage, whatever

may be its duration, I consider that the indication for the interruption of pregnancy exists only when the number of beats per minute remains above 100. The indication is present, clear, precise and urgent when the pulse-rate is permanently above 100 beats per minute. This is the precept I have taught, and this has been my practice for a long time past." Pinard makes no distinction between accidental and unavoidable hæmorrhage, and in the majority of cases of hæmorrhage in the later months of pregnancy no such distinction can be made. We are able to diagnose placenta prævia only when we can introduce our finger through the cervix and ascertain by direct palpation that the placenta is implanted upon the lower uterine segment. In the majority of cases this cannot be accomplished until the patient is in labour; we may suspect placenta prævia, but we cannot be sure. We agree entirely with Whitridge Williams when he writes:—"Owing to the serious danger of a sudden and occasionally fatal hæmorrhage, as long as complete or partial placenta prævia exists, I consider that pregnancy should be terminated as soon as possible after a positive diagnosis is made." But before the onset of labour it is seldom that the positive diagnosis can be made, and hence for our purpose we may, following Pinard's example, consider in one group cases of antepartum hæmorrhage due to separation of the placenta before the onset of labour. In practice we see many cases of antepartum hæmorrhage in which, by judicious treatment, the most essential element of which is absolute rest in bed, the patient is able to complete in safety the full term of gestation; we see other cases in which comparatively slight initial hæmorrhages are followed by bleeding of great severity. How are we to know in which cases to terminate pregnancy and in which to allow it to continue? We have already quoted Pinard's views, and as far as we have been able to ascertain no other writer has ventured to lay down so definite a rule. Pinard speaks with high authority and from a rich and long experience; if we are to act upon one definite rule we can conceive of none better than this for the purpose, but we must remember that many circumstances may render it fallacious. All women have not the same rate of pulse-beat; the normal for one woman may be 60, for another 80 or even 90; in these two women an acceleration to 100 beats per minute would have a very different significance. It seems that in hæmorrhage, as in so many other complications of pregnancy, we must take into consideration the social conditions of the patient as well as the entire clinical aspect of the case, and then ask themselves the question: "In this particular case will the life of the mother be seriously

imperilled if the pregnancy be allowed to continue?" Should the answer be in the affirmative the pregnancy must be terminated.

The best method of inducing labour in such a case offers a problem of some difficulty; in general, in cases of hæmorrhage, Krause's method is too slow and uncertain in its action, whilst rapid dilatation of the cervix is attended by grave dangers, particularly in cases of placenta prævia. In placenta prævia it is generally admitted that owing to the unusual development of blood-vessels in the cervix and lower uterine segment, lacerations of the cervix occur far more readily than in other cases, and therefore *accouchement forcé* in its various forms, whether by stretching the cervix open with the fingers (Harris's method), by means of metal dilators such as the instrument of Bossi, or by cervical incisions, is contra-indicated. There remain then two methods—rupture of the membranes and plugging the vagina. Recent statistics, particularly those from the Rotunda Hospital published by Colclough, show that the latter is the safer and more reliable procedure of the two. This method is one of considerable antiquity, but fell into disrepute until revived by Smyly in 1894. If it is to be practised successfully great attention must be paid to the details of the operation. These are described fully in Colclough's paper.

(δ) *Hydramnios.* Thomas Wilson (*Trans. Obstet. Soc., London*, Vol. XLI. for 1899, p. 255), in discussing the treatment of this condition, writes: "Drugs are powerless. The mother is in a condition of the greatest suffering and danger, and rapidly becoming worse. Our first duty is to her, in accordance with one of the fundamental principles of our art, and it becomes more easy to act upon this principle because the hydramnios inevitably leads either to the death of the fœtuses, or to the birth of children which practically never survive more than three days. The induction of abortion as soon as the diagnosis is made, and as soon as the symptoms begin to be urgent, is for these reasons clearly indicated. The best method appears to be puncture of the membranes." In his paper, Wilson merely defines hydramnios as "an excess of liquor amnii"; he does not state what quantity must be present to constitute the condition, hence it is not easy to criticise his treatment. It is, however, quite certain that many pregnancies complicated by excess of liquor amnii may be safely allowed to take their natural course, and that it is under certain conditions only that the necessity for terminating the pregnancy arises. Further, the mere quantity of fluid contained in the uterus is not the only point for consideration. The period of pregnancy

at which the excess of fluid forms, and the rapidity with which it accumulates are matters of equal importance. It is not very uncommon to see a woman whose uterus contains as much as 8 or 10 litres of amniotic fluid delivered at term; but, on the other hand, a very much smaller quantity of fluid may give rise to symptoms so urgent that the immediate termination of the pregnancy becomes imperative.

"The earlier the period of gestation at which the hydrops becomes manifest," writes Pinard, "and the more rapid the accumulation of fluid, the greater is the danger. Interference is indicated when the maternal organism presents one of the two following conditions:—(1) When, with œdema more or less marked and more or less generalized, there are associated dyspnœa, orthopnœa, or other symptoms of difficult respiration; (2) When simultaneously with the distension of the uterus there is developed severe costo-abdominal or diaphragmatic pain. Soon the skin becomes dry and earthy, the general depression very marked, and the excretion of urine so diminished that the total quantity passed in the twenty-four hours does not exceed five to six hundred grams—this is acute hydramnios. This form most frequently occurs in double pregnancies as dropsy of one or both fœtal sacs; it is sometimes, however, seen with a single fœtus. However that may be, in these two cases the interruption of pregnancy is clearly indicated."

(ϵ) *Pyelo-nephritis of pregnancy.* In 1892 Reblaud drew attention to certain cases in which suppuration in the kidneys was associated in pregnant women with dilatation of the portion of the ureter situated above the brim of the pelvis. It is now generally admitted that such dilatation is due to compression of the ureter between the pregnant uterus and the bony pelvis, and that as the result of such gradual compression a hydronephrosis is formed. Should pyogenic organisms, conveyed through the blood stream or as an ascending infection from the bladder, reach the kidney, pyelo-nephritis is established, and there are produced in the kidney-substance changes which permanently diminish its value as an organ of excretion, and in some cases immediately threaten the life of the woman. If this explanation be correct, and we have no reason to doubt it, we have in these cases an indication for the premature termination of pregnancy.

The diagnosis of the condition is, however, by no means easy; very similar symptoms may be caused by a renal calculus, or by other lesions which are totally unaffected by the termination of pregnancy. A very instructive case, illustrative of this, was recorded

by Maxwell at the last meeting of the Obstetrical Society of London (*Jour. Obst. and Gynæc. Brit. Emp.*, February, 1906, page 129). The diagnosis of pyelo-nephritis of pregnancy was made, but a subsequent operation proved that the symptoms depended upon a calculus. The whole subject was reviewed by Cumston in the last volume of this JOURNAL (Vol. VIII., p. 221). His records show that whilst in some cases the pregnancy may be allowed to reach full term, in others the immediate induction of labour may be urgently indicated. If the renal pelvis empties itself by the ureter, and the general condition does not give rise to alarm, a milk diet, rest in bed, and general medical treatment should be employed. If, in spite of this means, retention of pus persists, and the symptoms become aggravated, intervention must be resorted to: the choice lying between nephrotomy and the induction of premature labour.

"Now it appears to me that it is well to follow the natural course of pregnancy, and in serious cases, where surgical interference imposes itself, to empty the uterus—a relatively simple operation—rather than to resort to nephrotomy, which, in my way of thinking, should be reserved for those instances where obstetrical treatment remains without success. Many cases have been reported where serious accidents have ceased after spontaneous or induced labour. Without any doubt, by interrupting gestation the child is sacrificed, but in considering the prognosis, I have pointed out that interruption of pregnancy not infrequently takes place spontaneously. On the other hand, nephrotomy does not always prevent miscarriage or spontaneous premature labour, and usually, when the lesions are bilateral, nephrotomy is contra-indicated, and then obstetrical treatment must be resorted to" (Cumston).

Pinard, Lapage, Hofmeier and Schauta have all recommended the induction of premature labour—Schauta in all cases when eight months of gestation have been completed.

B. WHERE SOME PRE-EXISTING DISEASE IS AGGRAVATED BY PREGNANCY.

(a) *Disease of the Circulatory System.*

Heart Disease. We may assume that the dangers of a valvular lesion of the heart become markedly increased in the event of pregnancy. A damaged and diseased heart has too often small reserve to draw upon; a compensatory hypertrophy sufficient to meet the requirements of ordinary life may have developed, but when additional strain is thrown upon the organ this compensation fails and distressing symptoms result. Failure of compensation is not by

any means an invariable result of pregnancy in women with diseased hearts; many women with grave cardiac lesions pass through successive pregnancies, and are delivered at full term after a labour perfectly normal. Our knowledge does not permit us to say in any given case whether or not grave symptoms will arise. We have seen a patient whose life was despaired of in her first pregnancy pass through a second with no distressing symptoms whatever. The condition of the cardiac muscle is a factor whose importance is equal to that of the valvular lesion, and of this condition we have no means of judging accurately. It is impossible, in these circumstances, to lay down definite rules as to when pregnancy should be terminated. We are perhaps able to recognise when the life of the woman is threatened, but we must realise that by a hasty induction of labour we may only increase the danger. Thus Jardine writes:—"The results from induction are so bad that I am inclined to question the propriety of doing the operation. The risk is exceedingly great. In a bad case I should advise the induction of abortion before the fourth month, *i.e.*, before the extra strain has begun to tell upon the heart." (*Jour. Obstet. and Gynæcol. Brit. Emp.*, Vol. i., p. 399.) When we remember the liability to collapse and sudden death within a few hours of delivery, which is so marked a feature of these cases, we feel that Jardine's warning is justified. There are many authors who have attempted to define the indications for the termination of pregnancy. Fellner (*Cent. f. die Grenzg. der Med. u. Chir.*, 1902, p. 697) thus summarises his conclusions:—In cases of well compensated lesions it is only necessary to interfere where in a former pregnancy the woman was placed in danger of death,* and in non-compensated cases only if medical treatment prove ineffectual. Mitral stenosis and its complications demand active treatment. In grave cases at all periods of pregnancy the method of choice is rupture of the membranes, or if the symptoms are not urgent, after the 28th week the introduction of a bougie. When there is œdema rupture the membranes. Pinard is less dogmatic. "It is an indication for the interruption of pregnancy when the phenomena of dyspnœa and asphyxia show themselves. It is impossible to state precisely the moment at which interference is advisable; each case exhibits, so to speak, an individual physiognomy (physionomie spéciale); it is for the physician by his skill to determine the time. My experience has taught me that interruption of pregnancy is more often followed by success in the first than in

* We have just quoted a case which proves that it is not always necessary even then.

the second half, and that the result has been most happy when the evacuation of the uterus has been most rapid." It is generally agreed that mitral stenosis is the gravest lesion, that next in severity is aortic incompetence, and that in either of these conditions if symptoms of failure of compensation show themselves early in pregnancy abortion should be induced. In the later months of pregnancy the danger of collapse and sudden death shortly after delivery renders induction a somewhat risky method of procedure. Most writers, however, agree that in some cases it is the duty of the obstetrician to take this risk.

The Grave Forms of Anæmia. The combination of these diseases with pregnancy is happily a somewhat rare one. Herman, in 1901, was able to discover records of only twelve cases in which pregnancy was associated with leukæmia, and its association with pernicious anæmia, Addison's disease and hæmophilia must be rarer still. As the result of his researches Herman (*Trans. Obstet. Soc., Lond.*, 1901, p. 234) concluded that the presence of an enlarged spleen and liver caused patients with leukæmia to suffer more from the abdominal distension of pregnancy than healthy women do, that the symptoms of leukæmia were aggravated during pregnancy, that there was a great tendency to abortion or premature labour, that death sometimes followed quickly upon the termination of the pregnancy, but that if the patient survived a marked improvement took place. He concludes his paper with the words:—"I think the practical conclusion follows that in leukæmia with pregnancy the induction of premature labour or abortion is indicated as a therapeutic measure." In the discussion which followed the paper he explained that this remark applied only to cases in which the symptoms caused suffering or were aggravated after the onset of pregnancy. With regard to other forms of anæmia complicated by pregnancy the literature is very scanty. Schauta remarks of pernicious anæmia that the induction of labour does no good and sometimes appears to hasten death; and of hæmophilia, that the danger of hæmorrhage is postpartum and not antepartum. We have no experience of any of these diseases complicated by pregnancy.

Graves's Disease. In patients the subject of exophthalmic gôitre pregnancy often gives rise to a severe exacerbation of the symptoms. We have recorded a very remarkable case in the *Transactions of the London Obstetrical Society* for 1904, page 95. In this patient it was found necessary to induce labour or to procure abortion no less than four times, and, finally, to remove portions of both Fallopian tubes.

(β) *Diseases of the Respiratory System.*

It is generally admitted that in the treatment of acute diseases of the lungs, such as pneumonia, the induction of premature labour has no place; and amongst the chronic affections, tuberculosis is the only one in which the interruption of pregnancy has been urged as a therapeutic measure, and even here there is a marked division of opinion. Schauta writes: "In the less grave cases, if the tuberculous process makes rapid progress, interruption of the pregnancy is indicated even in the last months, in the interests of both mother and child." Malsbary (*Amer. Jour. of Obstet.*, July, 1905), favours the interruption of pregnancy only when there are strong indications such as incontrollable vomiting; and to the question, "Ought pregnancy to be interrupted in tuberculous women?" Pinard's answer is: "My reply is an absolute negative. That pregnancy frequently —but not always—aggravates the gravity of pulmonary tuberculosis I am well aware. But does there exist one fact which proves clearly that premature expulsion of the products of conception has retarded the evolution of the malady or arrested its fatal termination? I am not aware of it. For me the indication for the interruption of pregnancy never exists in the tuberculous woman. In the presence of a tuberculous pregnant woman the physician has only one thing to do—to treat the tubercle and to watch the pregnancy."

These are weighty words, and when we realize that during pregnancy the general condition of most tuberculous women improves, that it is only after delivery that the ravages of the disease become manifest, and, further, that there is no evidence to show that induction after the child is viable moderates in any way the progress of the disease, we are compelled to believe that it is better to allow the pregnancy to take its course.

(γ) *Diseases of the Urinary System.*

That the well-being of the fœtus *in utero* is imperilled materially by renal disease in the mother is sufficiently proved from the study of statistics. In large series of cases it has been shown that between 50 and 60 per cent. of the children either die *in utero* or are expelled so prematurely that death occurs within a few days of delivery. Fehling has insisted strongly upon the importance of chronic nephritis as a cause of intra-uterine death; and, from the constant association of this condition with arterial degeneration, we are not surprised to find that abortion and accidental hæmorrhage are common events in pregnancy associated with nephritis. When we consider the effects of the pregnancy upon the mother, we find that although, contrary to the views previously held, eclampsia is an

exceedingly rare complication, a condition of uræmia is constantly to be apprehended. The renal tissues may be adequate to carry on the excretion of waste products the result of the normal maternal metabolism, but they cannot respond to the increased strain thrown upon them in the event of pregnancy. Further, the kidneys themselves undergo a rapid degenerative change, and at the end of the pregnancy show more advanced structural changes. The existence of nephritis is not, however, to be regarded *per se* as an indication for the induction of labour; under favourable circumstances and with constant careful supervision, normal delivery of a living child at full term may be hoped for in many of these cases. We agree entirely with Hofmeier's dictum: "In chronic nephritis pregnancy should be interrupted artificially in the interests of the mother, when, in spite of suitable treatment under favourable conditions, the symptoms of the disease not only do not abate their severity, but even become aggravated."

The indication for induction is not to be found in one symptom only, but in the study of the whole symptom-complex—headache, œdema, breathlessness, vomiting, albuminuric retinitis, as well as the changes found in the urine. Of single symptoms probably the most important indication is a diminution in the quantity of urine passed. This point is emphasised by Pinard:—"There is no special symptom which constitutes a criterion for intervention. It is in the whole aspect of the case that we must seek this indication. However, in the relatively numerous cases in which I have been concerned I have relied upon the quantity of urine passed in the twenty-four hours. When the quantity collected in this interval is equal to 800 or 1,000 grammes, I believe that intervention is only indicated under exceptional circumstances, but when the quantity falls and remains below this figure I believe that it is necessary to terminate the pregnancy." It is probable that the total quantity of urine passed is a more reliable indication than the amount of urea. The urea excretion depends upon a great many circumstances; a slight alteration in diet, constipation, an increase in muscular exertion may lead to marked variations in the urea output. When a patient is kept absolutely in bed upon a fixed diet, if the whole twenty-four hours' urine be examined and the total urea estimated, a valuable indication may be found, but under other conditions the total quantity of urine passed is probably of more importance. When we remember the high fœtal mortality, of which we have just spoken, we shall recognise that we are fully justified in giving the mother the benefit of any doubt in these cases.

(δ) *Certain General Diseases.*

In addition to those indications we have considered, various other diseases have been found to undergo marked exacerbations during pregnancy, and occasionally to call for its premature termination. Amongst these we may mention diabetes, hæmoglobinuria, osteomalacia and purpura. For a discussion of these conditions we must refer the reader to the various monographs devoted to their consideration.

In dealing with so vast and difficult a subject it would be presumptious in the extreme to attempt to lay down definite rules. We must remember that it is the duty of the physician to treat the patient and not the disease; and the decision in a given case as to whether pregnancy should be terminated calls for the exercise of all those faculties of observation and of reasoning which are so essential for the successful practice of our profession. A patient is often only too willing to make an ailment, perhaps in itself trivial, an excuse to avoid the responsibilities of maternity, or the restrictions upon her social life which a pregnancy imposes. The list of indications we have given is indeed a formidable one, but we cannot insist too strongly that in many of the conditions discussed it is only under exceptional circumstances that the premature termination of the pregnancy is the necessary or proper treatment.

REVIEW OF CURRENT LITERATURE.

OBSTETRICS.

The Etiology of Eclampsia; a Contribution to the Question of Treatment by Rapid Delivery.

LIEPMANN (W.) *Münch. med. Wchnschr.*, Dec. 19th, 1905.

IN a striking and suggestive communication Liepmann, writing from Bumm's clinic in Berlin, puts forward strong arguments based on experiment in favour of the placental origin of the toxin of eclampsia. A preliminary article appeared from his pen on April 11th, 1905, in the same paper.

His experiments were briefly as follows:—The placentæ of eclamptic patients were minced, dried, and ground into a fine powder. Of this powder a suspension in physiological salt solution was made, a few drops of toluol being added to hinder germ development, and injected in definite amount into the peritoneal cavity of rabbits. Altogether, 113 experiments were made. Control experiments were not instituted, as previous research with the normal placenta has proved that it is relatively non-toxic. Only those animals in which there was no doubt as to the absence of bacterial infection after injection were used for his purpose. The effect of the toxin was in the greater number of cases so rapid that all question of infection could be excluded. Soon after injection, often within five minutes, the rabbits became comatose, no longer reacting to cutaneous stimuli, with pupils widely dilated and fixed, and greatly accelerated respiration. The temperatures varied, sometimes sinking below normal or rising as high as 40°C. In many cases pronounced convulsions ensued. In some convulsions were entirely absent, especially when the animals died within an hour. Most died within the first 12 hours, five after 15—20 hours, and five within 2—8 days. As regards the manner in which the toxin exists in the placenta, experiment proved that it is fixed in the protoplasm of the cell. The juices of the placenta were mechanically separated from the placental pulp. Injection of the placental pulp proved fatal. The juices extracted from the same placenta, when evaporated down

under a vacuum and injected intravenously, produced no untoward symptoms. But in placentæ from cases of extreme toxæmia a moiety of the toxin was found in the extracted juices as well. It was further found that the extract when toxic could be deprived of its toxin on addition of reagents which precipitate albumen. They either precipitated the toxin or carried it down with the precipitate. Six animals treated with the de-albuminised placental extract were unharmed, though the pulp of the same placentæ proved rapidly fatal. That the toxin is very labile and difficult to preserve was shown by trials of the same placental powder at different dates. The powder which proved fatal on one day was innocuous the day following. It was found that the toxin was destroyed by prolonged shaking up with toluol. Attempts to extract the toxin by chemical means were fruitless. To sum up, the toxin found in eclamptic placentæ exhibits the following properties: it is firmly fixed in the albuminous molecule; it is extremely toxic for rabbits; it is highly labile; it can be removed from the pressed-out extract by reagents which precipitate albumen. Hitherto the extraction chemically has not been successfully accomplished. Granting, then, that this toxin is the true eclamptic poison and that it is elaborated in the placenta, this assumption admits of the following theoretical possibilities: (1) The severer the clinical picture, the more the toxin in the placenta; (2) The stronger the reaction of the organism, *i.e.*, the greater the number of fits, the greater the quantity of the toxin which has passed over into the maternal organism from the placenta, which is, in consequence, all the poorer in toxin. (3) Despite the giving off of a great amount of toxin, its production lasts in the placenta until its expulsion; despite very intense reaction of the organism, the placenta is found rich in toxin. (4) Despite a slight reaction of the organism, the placenta is found rich in toxin, as it commences to be formed in it shortly before the placenta leaves, and only passes out into the maternal organism in small quantity. Liepmann then experimented with the injection of the placental powder of three patients who had had only a single fit. The placental powder of two fatal cases with 27 and 20 fits respectively, was also injected into a second series of animals. Two animals received 1 gram of the placental powder of each of the three patients who had had but one fit. All six animals died. Four animals received 1 gram of the placental powder from the patient with 20 fits and one lived; three animals received 1 grm. of the placental powder of the patient with 27 fits, and here, again, one lived. In the patients with one fit, little or no albumen was found; the other two had 2% albuminuria. Other placentæ of patients with

6, 3, and 11 fits were also experimented with, and with fatal results to all the animals. The deduction from this series of experiments is, that the greater the amount of toxin that has passed over into the organism and the more the number of fits that occur the less is the amount of toxin found in the placenta: conversely, the placenta is so much the richer in toxin the fewer the fits that occur. Mention is made of Bumm's interesting case, which formed a pendant to that published by Meyer-Wirz of eclampsia without fits, where a 2-para was brought to hospital having rallied from two attacks of syncope with great cyanosis. Her general condition indicated imminent eclampsia, and during preparation for vaginal Cæsarean section, she suddenly became blue, respiration ceased, though the heart's action continued, and, despite all efforts, death supervened. An autopsy revealed all the lesions associated with eclampsia, and two animals injected with the placental powder died in an hour.

Next to the occurrence of fits, throughout his cases Liepmann found the most constant symptom to be the presence of albuminuria. But it is of only slight prognostic significance, the albuminuria and the severity of the eclampsia not being co-related in any constant manner. He discusses the theory of auto-intoxication and the fœtal theory. In common with the placental theory here put forward they have one thing in common, viz., they recognize the injurious influence of the products of metabolism of the pregnant uterus. On the grounds that the anatomico-pathological findings in the kidneys of patients dying from uræmia differ so considerably from those of fatal eclamptic cases; from the fact that eclampsia without albuminuria is no rarity; and seeing that very severe cases of nephritis are safely delivered, the case for the uræmic theory and, on similar grounds, the hepato-toxæmic, is dismissed. This line of argument is strengthened by the fact that immediate delivery in Bumm's hands has reduced his mortality from 30% to 1·8%. As regards the fœtal theory, why is the child, if it be the true originator of the toxin, so seldom injured by a substance that proves so fatal to the mother? When the child does die, is it not expectant treatment, or the obstetric procedure, at whose doors the blame should be laid? Hitschmann's case of eclampsia in the 5th month of pregnancy is quoted, where no fœtus was found afterwards, and another case is also quoted where eclampsia developed though the fœtus was already eight days dead, being born macerated. All these facts, as well as the formation of ferments in the placenta (and by analogy, why not the formation of placental toxins?), lend support to the theory of the genesis of the toxin of eclampsia in that organ also. That the chorionic villi play an

important part in the origination of the eclamptic poison is deemed very probable. Research regarding the toxicity for animals of the organs of newly dead children of both normal and eclamptic mothers is being carried on—a link in the chain of argument which Liepmann thinks an important one. In explanation of the occurrence of fits post partum, attention is called to the liver, which, with the brain and kidneys, is one of the three principal organs evidently attacked by the eclamptic toxin, and serves as a filtering organ, as in a number of other toxæmic diseases. In it is deposited a portion of the toxin eventually to be rendered innocuous; from it, in cases with a special predisposition, a further passing over of the toxin into the organism can take place, and eclampsia in the puerperium is thus explained. As regards the relations of the toxin of eclampsia to lesions of the kidney, Liepmann holds that injury to that organ occurs as a secondary affection and follows on the toxæmia of the maternal organism, the parenchyma of the kidney being especially involved, either directly or through the brain by a vaso-constrictor mechanism. Cases of eclampsia without albuminuria are to be explained by the fixation of the toxin by the brain-cell, as occurs in tetanus. Not until the organism is surcharged with toxin is the renal parenchyma open to receive injury. That, however, to an already existing kidney of pregnancy or parenchymatous nephritis eclampsia may be superadded, is, of course, self-evident. Starting from the reasoning that the eclamptic toxin must first dominate the brain, a powder was made from the brain of three eclamptic patients after the method adopted in eclamptic placentæ. In one of these three cases the addition of toluol was designedly omitted. All nine animals injected with this brain-powder gave no special reaction and lived. From this it may be inferred that either the toxin is fixed in the brain and thus neutralized, or that there is no toxin found in the brain. The control-experiments here were profoundly interesting. For toxic eclamptic placental powder when mixed with normal brain essence and injected in certainly lethal quantities gave rise to no symptoms in the animals experimented on, all of whom lived. Thus it is shown by a series of experiments as yet too few to be quite conclusive that the toxin of eclampsia is fixed in the brain, that this fixation takes place similarly to the like fixation of the tetanus toxin, as experiments *in vitro* show.

Finally, before the therapeutic utility of these researches is spoken of, the etiological facts are to be summarized as follows: (1) In the placenta a toxin is found which is absent from normal placentæ. (2) It is identical with the toxin of eclampsia, for the more

the toxin that is absorbed from the organism the less there is found in the placenta; and conversely, the less the toxin that passes over into the maternal organism, the richer the placenta is in toxin. (3) The toxin evinces a marked affinity for the brain cells which neutralize it and which are paralysed by it. (4) The toxin acts deleteriously on the renal parenchyma as well as on the liver. (5) The injury to the kidney is secondary to the toxæmia—an already existent albuminuria may be markedly increased by the toxin. (6) The chorionic epithelium appears to play an important part in the genesis of this toxin, the placenta is thus the place of elaboration and point of departure of the toxin.

Immediate delivery is therefore the best treatment of eclampsia, and in support of this contention, Liepmann avails himself of Bumm's statistics. At first, with purely symptomatic treatment and the use of narcotics, which was the method in Würzburg and Basel, up to the year 1895, the mortality was 30%. From 1895—1900, in Basel, under the influence of Bouchard's teaching, the treatment was by narcotics, warm packs, blood-letting, and saline infusions, and the mortality 30%. From April, 1901 onwards, eclamptic patients at Halle and Berlin were delivered immediately. The following figures are given: April, 1901 (Halle), 25 patients were thus treated and 2 died—mortality 8%; April, 1901, to present date (Halle: Berlin), 104 cases treated, and 3 died—mortality 2·8%; April, 1904, to present date (Berlin), 79 cases treated, and only 1 died—mortality 1·8%. This single fatal case was a curious one. A 3-para, æt. 29, 25% albumen, three fits a.p., vaginal Cæsarean section. Uninterrupted puerperium. Suddenly, on 13th day, six severe fits in 12 hours. Death during last fit.

In compiling these later statistics, in order to estimate properly both the therapeutic value of immediate delivery and the influence of the eclamptic toxin, the following cases were not included: (1) all cases brought in after delivery, 4 (Berlin); (2) all cases first coming under treatment 6—12 hours after the first fit, which thus fall under the heading of expectant treatment. Of the 104 cases in Halle: Berlin, the following were therefore deducted:—two cases of aspiration pneumonia, which died at the end of the 1st and beginning of the 2nd week respectively; four cases brought in postpartum; five cases brought in after a delay of hours. After this deduction the mortality stands at 2·8%.

In conclusion, what should the practitioner do in cases of eclampsia? If forceps has no contra-indication, immediate application is advised. If contra-indicated, version and extraction

or perforation should be performed. Müller's metreurynter and Bossi's dilator have also their uses. But with an undilated os, delivery by *hysterotomia anterior* is the sovereign method of treatment. These various methods, as well as the decision as to whether the patient be sent to a hospital or the services of a specialist sought for, depend on the local circumstances and on the technical skill of the practitioner. Other methods of treatment, subsidiary, but yet yielding beneficial results, are subcutaneous saline infusion and venesection. Cardiac stimulants are of course indicated where the pulse is weak. Artificial respiration is strongly recommended, especially when the patients are very comatose and breathing superficially. Warm packs are condemned, as the concomitant sweating concentrates the toxin, as recently pointed out by Bumm. Narcotics and chloroform should be but sparingly used, chloral hydrate *per rectum* giving the best results when the restlessness is extreme.

Liepmann expresses the hope that a specific in the form of a serum may yet be forthcoming. Research in this direction is being instituted.

ROY DOBBIN.

The Presence of Sarco-lactic Acid in the Cerebro-spinal Fluid in Cases of Eclampsia.

FÜTH and LOCKEMANN. *Zentral. für Gynäkol.*, 1906. No. 2.

SINCE Zweifel has proved that sarco-lactic acid is regularly present in the blood and urine in eclamptic subjects, the authors concluded that it must be present in other fluids of the body, and, as opportunity offered, they proceeded to put their theory to the test in cases of lumbar puncture—a method employed by Krönig in the treatment of eclampsia. Twenty centimetres of cerebro-spinal fluid were drawn off through a lumbar puncture after the fourth eclamptic seizure. This fluid was alkaline, specific gravity 1,000; ·61 chlorides were present, sulphates absent. There was a small quantity of albumen present. The cerebro-spinal fluid in ethereal solution gave a yellow colouration with Uffelmann and Kelling's test. Other acids which would do the same, *e.g.*, oxalic, malic, and citric, are not soluble in ether, and could therefore be excluded. Formic acid, which is soluble in ether, gave a reddish colouration, which, on shaking with ether, entirely disappeared. Therefore the yellow colour obtained was to be explained only by the presence of lactic acid. A confirmatory test was employed. Uffelmann's solution, when shaken up with ether, entirely loses its amethystine colour. On

the addition of lactic acid a yellow tinge appears in the previously colourless solution. Having proved the presence of this acid in cerebro-spinal fluid, the authors estimated the percentage present in the fluid obtained from two further cases of eclampsia.

Twenty-one centimetres of fluid were drawn off after the eleventh fit from a patient who recovered. The fluid was slightly acidulated with sulphuric acid, a little animal charcoal was added, and the fluid boiled in order to precipitate the albumen. The filtered solution was neutralised by the addition of barium carbonate. The cold filtrate was freed from fat by the addition of sodium hydrate and ether. It was next strongly acidulated with phosphoric acid and again shaken up with ether. The ether was then evaporated, the deposit was dissolved in water, and the watery solution mixed with oxide of zinc, heated, and filtered. The filtrate was dried *in vacuo* and the result was a crystalline salt which proved microscopically to be zinc paralactate. The quantity obtained corresponded to 1·06‰ of sarco-lactic acid. This corresponded to twice as much sarco-lactic acid as was found in the arterial blood of the same patient on the same day.

The second quantitative investigation was made on fluid obtained after the tenth fit in a patient who had died of eclampsia. Eighteen centimetres of cerebro-spinal fluid were employed. The crystals of zinc paralactate corresponded to 0·47‰ of sarco-lactic acid. The authors state that the qualitative test in Case 1 did not distinguish between sarco-lactic acid and the lactic acid of fermentation, but the chemical means employed in their quantitative analysis was definite proof of the presence of sarco-lactic acid, from which they argue "*ab uno discite omnes.*"

CUTHBERT LOCKYER.

Lymphangioma of the Labium Minus in a Pregnant Woman.

BRINDEAU. *Bulletin de la Soc. d'Obstét. de Paris*, November, 1905.

THE tumour, which was as large as a fœtus at term, occurred in a woman 25 years of age, who was advanced 8½ months in her second pregnancy. She had noticed nothing abnormal until about the second month of the gestation. The tumour had increased slowly till the fifth month, and had then suddenly enlarged to the size of an adult's head. She had not consulted anybody, and it was only the escape of *liquor amnii* and the onset of labour that brought her to the hospital.

The tumour, which had the shape of a small ham, was attached to

the left labium minus. Its covering was partly skin and partly mucous membrane. An ulcerated patch, the size of a five-franc piece, gave rise to a very fœtid secretion. The tumour was soft and painless.

The labour proceeded normally and the woman was delivered without difficulty. The tumour was then enveloped in compresses of peroxide of zinc, as Brindeau preferred to wait several days before undertaking its removal. On the third day of the puerperium there was a slight rise of temperature, and as the ulceration led to a continuous oozing he decided to operate. Already the mass had sensibly diminished in volume. Anæsthesia was produced by the intra-spinal injection of stovaine, and the patient felt nothing of the incisions or suturing. The convalescence was uneventful.

Brindeau remarks that it would have been interesting to see what would have happened to the tumour during the lying-in, but that the gangrenous ulceration forced his hand.

On section the tissue was gelatinous, and a certain quantity of serous exudation was exuded on pressure. Microscopic examination demonstrated that it was a lymphangioma.

An illustration accompanies the description.

R. Hamilton Bell.

Experience of Dilating Operations in Midwifery.

Hammerschlag. *Zeits. für Geburts. und Gynäkol.* Bd. lvi., Heft 2.

This paper is based on eight years' experience in the Königsberg Clinic. Among 8,000 labours dilating operations were performed in 243 cases. Five methods were employed—(1) dilatation by the half-breech with traction on a foot; (2) dilatation by a bag; (3) Bossi's dilators; (4) incisions of the cervix; (5) vaginal Cæsarean section. The indications for dilatation were found in placenta prævia, infection, eclampsia, accidental hæmorrhage, morbus cordis, pneumonia, transverse lie, contracted pelvis, prolapse of the cord, and carcinoma of the cervix.

1. *Dilatation with the half-breech* was performed in 135 cases, of which 110 were cases of placenta prævia. Dilatation occupied, on an average, two hours. It is a rule in the Königsberg Clinic that the aftercoming head must never be delivered in cases of placenta prævia until it has passed through the external os. In one case where this rule was broken a deep tear of the cervix was caused, leading to fatal hæmorrhage. The mortality among the children was 90 per cent.

2. *Dilatation by bags*, 47 cases. Braun's bag was used in the

early part of the eight years, then that of Champetier de Ribes, while during the last few years Müller's metreurynter only has been used. The average time taken in dilatation was seven and a half hours. Thirty-six per cent. of the children were born dead.

3. *Dilatation with Bossi's instrument* was performed in 25 cases. A four-fold instrument with pelvic curve and removable caps was used. The operator kept his eye on a watch and opened the instrument ½ c.m. every two minutes at first, later, as the tension became greater, only ¼–⅓ c.m. The time occupied in dilatation varied between 15 and 45 minutes. It is important to remember that the cervix remains a canal after dilatation with Bossi's instrument, even when fully dilated. Great care is necessary in extracting the after-coming head. Out of 15 cases there were five in which severe lacerations extending up to the vaginal insertion occurred. The fœtal mortality was 44 per cent.

4. *Incisions* were made in 30 cases, not by Dührssen's method, but only when the cervix was completely "taken up" and the external os remained as a sharp edge. Three incisions were made, two lateral and one posterior, up to the vaginal insertion. No anterior incisions were made, for fear of further tearing into the bladder. The incisions caused no bleeding. Forceps extraction was made easy by the incisions, which required no sutures, and caused no trouble afterwards. Some of the patients were delivered spontaneously in subsequent labours. Fœtal mortality 23 per cent.

5. *Vaginal Cæsarean section*, 7 cases, 2 of carcinoma of the vaginal portion of the cervix, 5 of eclampsia. An anterior incision was made. Hammerschlag considers that a posterior incision also should be made in certain circumstances. Schuchardt's para-vaginal incision or Dührssen's vagino-perineal incision is advisable. The placenta *must* be removed before the sutures are inserted, otherwise they may be torn out. Tamponade of the uterus in these cases is to be avoided if posible, as removal of gauze is likely also to tear out the stitches. Hammerschlag considers Dührssen's vaginal Cæsarean section to be an excellent operation, involving only slight injury and danger.

The dangers which all the methods have in common are injury to the cervix and infection.

Laceration of cervix: by bag, average duration 7½ hours, 24 per cent.; by half-breech, average duration 2 hours, 29 per cent.; by Bossi's method, average duration half an hour, 33⅓ per cent. Incisions made by Dührssen's method, contrary to his teaching, readily tear further. Made by Hammerschlag's

method, *i.e.*, not until cervix is completely "taken up," the incisions do not tend to tear further.

Mortality from infection in consequence of the dilating operation: Incisions, Bossi's dilatation, 0 per cent.; bag, 3 per cent.; half-breech, 2 per cent. Packing with iodoform gauze in cases of placenta prævia is a very dangerous practice and likely to be followed by sepsis.

Morbidity in previously aseptic patients: Bossi's method, 0 per cent.; incisions, 30 per cent.; half-breech, 38 per cent.; bag, 39 per cent.

In eclampsia the best results followed the use of Bossi's dilators, while the dilating bags gave the worst results, probably because the dilatation was slower and there was increase of intra-uterine pressure. Dilatation by the half-breech was good treatment as regards the mother, absolutely fatal to the child.

Placenta prævia. Dilatation followed by plugging with the half-breech gave absolutely certain good results as far as the mother was concerned, but is bad for the child. The bag does not stop the hæmorrhage so certainly, but is better as regards the child.

In infection, incisions gave the best results. Dilatation with the half-breech and by Bossi's method were about equally good as regards the mother, but the former was absolutely fatal to the child.

Indications and advantages of each method. Dilatation with the half-breech is the best method of stopping the bleeding in placenta prævia—it did not fail once—but is practically fatal to the child. Plugging is very dangerous on account of infection. Midwives are cautioned to plug the vagina with iodoform gauze as seldom as possible in placenta prævia. As long as a bag is in, the mother is safe from hæmorrhage, and the child has a better chance with the bag than with dilatation by the half-breech. But when the bag comes out bleeding may occur. Turning then and rapid extraction of the after-coming head are likely to result in death of the child.* The use of the bag is not good treatment in eclampsia, but is the best in induction of premature labour. Bossi's dilators are specially indicated in cases where the pains are harmful to the patient, particularly in disease of heart and lungs, and in eclampsia and accidental hæmorrhage.

Incisions of the cervix are indicated in primigravidæ, in whom, the membranes having ruptured, the cervix has been completely "taken up," but the external os has not dilated. Vaginal Cæsarean

* Note by abstractor. Does not this mean that the bag is not large enough, and so has not dilated the cervix fully?

section is indicated in eclampsia when labour has not begun, and in inoperable carcinoma of the cervix. In cases where an anæsthetic cannot be given, however, Bossi's method is better. Dilatation by the half-breech and incisions are methods that can be used safely by the general practitioner. Bossi's dilators should be used only by a specialist. Vaginal Cæsarean section should be performed only in the clinic.

HENRY RUSSELL ANDREWS.

Two Cases of Acute Inversion of the Uterus.

JUPP (R. T.). *The Transvaal Medical Journal*, December 1st, 1905.

CASE I. A Baralong woman, aged 40, multipara, gave birth to a child, only her husband being present. Half an hour afterwards she asked her husband to "rub her stomach" to make the after-birth come away. Soon after he started rubbing she was seized with violent pain, which made her bear down. This lasted about ten minutes, when a lump came out between her legs, and the pain ceased. There was neither hæmorrhage nor shock. The placenta had been born at the same time as the child. There were no anomalies of placenta, cord or membranes. The lump between the legs was the inverted uterus. It was easily reduced under chloroform. Recovery was uninterrupted.

CASE II. A Dutch woman, aged 24, multipara, was normally delivered of a full term child on May 2nd. An hour later the attendant, a woman without experience in midwifery, pulled on the cord to try and get the after-birth away. The patient was seized with violent pain, and a lump appeared between the legs. An experienced Dutch midwife was sent for, and she stated that the lump was the womb turned inside out, with the after-birth still attached, and that after removing the latter she pushed the womb up into its place, a procedure which she said was very easy. The writer was summoned because the patient was in a condition of collapse. She revived after the administration of restoratives. Recovery was complete and uneventful.

The ease with which reposition was effected in each case is worthy of notice.

FRANK E. TAYLOR.

The Methods of Infection in Puerperal Fever.

GORDON (A. KNYVETT). *Public Health*, January, 1906.

THE author of this paper is the medical superintendent of a large fever hospital, and, during the last three years, he has carefully investigated fifty cases of puerperal infection, not only in the wards, but also in the bacteriological laboratory.

Owing to the passing of the Midwives Act, for the proper administration of which every medical officer of health is more or less directly responsible, the subject of puerperal disease will claim more attention. It is now essential that the medical officer of health should know as much about this disease as he does about scarlet fever, for in many parts of the country he will not only have to administer the Midwives Act, but also treat the disease on account of which the Act was framed.

With regard to the sources of infection in puerperal fever, Dr. Gordon gives some interesting information which may prove of much value in the important work of preventing this disease. On the admission of each patient to hospital, an anæsthetic is given if necessary, and a very thorough examination made in a good light. The parts are well exposed; cultures are taken from the interior of the uterus, and, if necessary, fresh specimens made for bacteriological examination. Whatever treatment may be necessary is then proceeded with at once, and serum of one type or another is given. Subsequently the bacteriology of each case is studied in the hospital laboratory.

There is a more or less general opinion in the profession that puerperal infection is a matter of chance; that it is a calamity that may come to the patient of the careful as well as of the careless; that it could, in fact, only be prevented by the adoption of elaborate antiseptic precautions that are impossible in general practice. Hence it happens that the relatives are very apt to blame the patient's medical attendant. Dr. Gordon's experience clearly shows that this attitude of the public to the medical man is far from a just one. In the last thirty-seven of his cases he was able to obtain accurate histories of what took place before the infection of the patient. The conclusions he arrives at are of considerable interest.

I. Of the thirty-seven cases, twenty-three, or 62 per cent., were not attended by a medical man until just before the admission of the patient. The medical man, therefore, must be held blameless.

2. An analysis of the "midwife's cases" showed that the interval

between the onset of the illness—which was determined either by the occurrence of a rigor, or by a rise of temperature over 101°—and the sending for a medical man, was on an average no less than six days.

3. The midwife or monthly nurse of the patient is responsible in Manchester for the bulk of notified cases of puerperal sepsis, and probably this obtains also in other large towns.

4. The current opinion that the infection of puerperal septic disease is implanted at the time of delivery requires modification. While some infection takes place then, as is shown by the shortness of the incubation period (sometimes within twenty-four hours after delivery), yet, in the majority of midwife-infected cases, the period elapsing between confinement and the onset of the illness is much longer, ranging, in fact, from four to eight days.

5. In the majority of midwife infections the virus is implanted after delivery mainly by two agents—by dirty clothes, and by the practice of giving vaginal douches. In almost all these cases *the organism present was the B. coli communis.*

6. In the cases that were possibly infected by medical men the incubation period was very much shorter, and rarely exceeded forty-eight hours. In every case *the organism present was some form of streptococcus.* In all these cases there had been instrumental or other interference; commonly extensive laceration of the cervix or perineum was found; sometimes there was retention of pieces of placenta or membrane in the uterus.

It seems clear, therefore, that puerperal septic disease is caused most frequently by midwives, by infection subsequent to delivery, and that, in the minority of cases that are apparently due to the practitioner the cause is obvious and could have been easily avoided. The present directions to midwives, which are mainly directed towards the prevention of infection during and shortly after delivery, may with advantage be extended so that they may cover the later and more common infection. Firstly, the midwife should be made responsible for the immediate covering of the external genitals with an antiseptic pad, and with maintaining it in position for at least ten days after confinement. This pad must be changed whenever the bowels or bladder are emptied. Secondly, the practice of giving vaginal injections, except when ordered by the doctor, should be abolished. Thirdly, the use of the "Higginson" syringe should be forbidden altogether, either for the purpose of giving an enema or for vaginal douching; it is better that the midwife should give enemata by the douche, and then she will not be tempted to use a "Higginson" for both purposes.

In concluding this valuable paper the author raises a very important question which requires serious consideration. As the Midwives Act comes more fully into force, there will probably be an increase in the notifications of puerperal sepsis. What is to be done with the cases? Obviously the best thing is to admit them to a fever hospital, and then expert gynæcological assistance should be summoned by the Sanitary Authority whenever it may be required. Treatment must not stop short at rescue from immediate death, but should aim at saving these patients from a life made miserable by chronic pelvic pain and invalidism. It is the duty of the local Sanitary Authority to supply the remedy by providing adequate surgical assistance in the isolation hospital.

OLIPHANT NICHOLSON.

GYNÆCOLOGY.

Dermoid Ovarian Cyst simulating Floating Kidney.

ISAACS (A. E.). *Medical Record*, December 30th, 1905.

A GIRL, aged 19, who had suffered from pain in the epigastric region and in the right side of the abdomen, was admitted to hospital for an acute abdominal condition. Four days previously she had been seized with severe pain in the right side of the abdomen, especially in the right renal region, accompanied by vomiting, which lasted two days. There was much vesical irritability with frequent micturition. On admission the acute symptoms had subsided. A tumour, the size, shape, and consistence of a kidney ,was found in the abdomen. It had a tendency to locate itself in the right kidney region, but was so freely movable that it could be pushed upwards under the costal margin and downwards into the pelvis rendering bimanual examination possible. Urinary examination was negative. An incision along the outer border of the right rectus exposed the tumour, which proved to be a dermoid ovarian cyst with a twisted pedicle seven inches in length.

FRANK E. TAYLOR.

Hysteropexy, Pregnancy, and Labour, with Report of a Case.

GRANT (GORDON). *Transvaal Medical Journal*, November 1st, 1905.

THE writer of this paper records an instance of the serious troubles which the operation of hysteropexy may cause in the event of a subsequent pregnancy. The patient in this case sought advice when

six months pregnant for pain in the lower part of the abdomen. Ventral fixation had been done about six years previously, and had been followed by prolonged suppuration in the wound with the discharge of silk ligatures at intervals. On abdominal examination the uterus was at the level of the umbilicus and appeared very broad transversely. It was adherent to the abdominal cicatrix except at its highest part, puckering of the scar being caused by moving the uterus from side to side. *Per vaginam*, the os uteri was found lying far back and high up and was reached with difficulty; the anterior lip was very thick, and between the finger and the fœtus was felt the greatly thickened anterior wall.

After palliative treatment for a month the pain in the cicatrix had become more severe and the puckering more marked. The uterine wall was so thin that the fœtal parts could be felt with great ease, and the *os uteri* was at the level of the promontory. Labour was, therefore, induced by dilatation with the finger, followed by Champetier de Ribes' bag. Dilatation went on gradually till the *os* was quite $2\frac{1}{2}$ ins. in diameter and the posterior lip was above the promontory, when, in spite of frequent and strong pains and traction on the bag, no further dilatation took place. This was found to be due to the bag being driven against the promontory. Dilatation was completed by hand, version performed and the child delivered. When examined two months afterwards the uterine attachment to the abdomen was found to be very firm and dense, and to extend on to the fundus.

The writer considers that the only alternative treatment in this case would have been Cæsarean section at term, and that this was contra-indicated by the increasing pain and the dangerous thinning of the uterus. He also discusses the principles which ought to underlie all methods of hysteropexy in view of a possible future pregnancy.

JOHN S. FAIRBAIRN.

On the Anatomy of the Intra-ligamentary Urinary Bladder.

NATANSON and ZINNER. *Monats. für Geburts. und Gynäkol.* Bd. xxii., Ht. 5.

MALFORMATIONS of the bladder are not common occurrences, and it has not been fully recognised that the bladder does occasionally develop in such a manner as to more or less distend and separate the layers of one or both broad ligaments of the uterus. When this anomaly does occur it is termed "the intra-ligamentary bladder."

This condition was first described in 1887 by Ziegenspeck, and in 1901 a similar case was described by Tandler and Halban in their atlas on the "Topography of the Female Ureter." The authors describe very carefully four new cases of this malformation, giving very good illustrations of the anatomical relations of the distended bladders, and careful results of measurements of the relations of the ureters to the vagina, the bladder, and the trigone. It is true that this anomaly may not be of great clinical interest, but it must not be forgotten that all unusual developments of pelvic organs are apt to give most puzzling appearances if encountered during operations. The results of the authors' investigations are as follows:—

1. The intra-ligamentary bladder is a congenital anomaly.
2. It may be either uni- or bi-lateral.
3. If uni-lateral the uterus is pushed over to the opposite side, and incidentally the relations of the tube, ovary, and round ligament are altered.
4. A fluctuating tumour in Douglas's pouch or in the parametrium may be clinically an intra-ligamentary bladder.
5. In this condition the relations of the ureters are altered, generally being much further removed laterally from the vagina than is usually the case.
6. The peritoneum in such cases reaches very deep into the pelvis in *front* of the bladder, and a suprapubic operation cannot be performed without opening the peritoneum.

THOS. G. STEVENS.

Remarks on Conservative Gynæcology.

CUMSTON (C. G.) *The Clinical Journal*, January 3rd, 1906.

THE writer advocates the extension of conservatism in gynæcological surgery. The pathogenesis of infection has, he states, revealed the fact that the uterus is the primary starting-point of all the inflammatory conditions of the adnexa. The salutary influence of a well-directed intra-uterine treatment from the earliest appearance of the first sign of infection in the genital apparatus cannot be insisted upon too strongly, and curettement, free dilatation, and drainage of the uterus constitute very effective treatment. Certain types of tubo-ovarian inflammatory processes, such as catarrhal salpingitis, purulent salpingitis at the beginning, and hydrosalpinx may be cured by this treatment. In thirteen cases of metritis complicated with catarrhal salpingitis, where the patients had been advised to have

a radical operation, Cumston was able to obtain a cure by thorough curettement and antiseptic treatment, and three of these patients ultimately became pregnant and went to term. In several other cases of purulent salpingitis, where he deemed removal of the tubes necessary, and where the operation was refused by the patients, he did a thorough dilatation and curettement, and found that the tubes discharged by way of the uterus, and the patients ultimately recovered perfect health.

In pelvic suppurative lesions the writer prefers posterior colpotomy and drainage to cœliotomy or vaginal extirpation of the uterus or the appendages. In very acute cases, moreover, where it would be hazardous to open the abdomen with the purpose of performing any radical interference, drainage through the posterior *cul-de-sac* will relieve the patient of her septic symptoms and place her in such a condition that later on she will be able to undergo a radical operation with every chance of a successful outcome.

FRANK E. TAYLOR.

REPORTS OF SOCIETIES.

OBSTETRICAL SOCIETY OF LONDON.

Annual Meeting, Wednesday, February 7th, 1906, W. R. Dakin, M.D., F.R.C.P., *President, in the Chair*

Ovariotomy During Labour.

Dr. Herbert R. Spencer read a communication on this subject, which appears as an original article on p. 180 of this number of the Journal.

Dr. Herman said that he agreed with the main contentions put forward by Dr. Spencer.

Radiograph of Fœtus in Utero.

Dr. Heywood Smith showed a radiograph taken in the 36th week of utero-gestation. He considered that such photographs might prove of great service in determining the presence of twins, or varieties of presentations, besides any deformity of the pelvis.

Chorio-Epithelioma.

Dr. John Phillips showed a specimen removed by vaginal hysterectomy from a woman, aged 21, on account of recurrent bleeding for three months following a hydatidiform mole. By digital exploration of the uterus a softish, flattened swelling, the size of a bean, was detected high up on the posterior wall of the uterus. A small piece which was removed for examination proved it to be chorio-epithelioma. Some febrile symptoms occurred during the first fortnight after operation, but complete recovery followed. The patient has remained well for a year.

Dr. Cullingworth expressed the hope that the history of the case will be supplemented after the lapse of another 12 or 18 months.

Mr. Malcolm mentioned that in a case which he had reported, in conjunction with Dr. Cuthbert Lockyer and Dr. Hamilton Bell, the patient was alive and well four years and seven months after the operation.

Annual Address.

The President (Dr. Dakin) then delivered the annual Address.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting at Manchester, January 19th, 1906, Dr. D. Lloyd Roberts, *President, in the Chair.*

The Evolution of Operative Gynæcology.

Dr. Lloyd Roberts, the retiring President, gave a valedictory address on this subject. He remarked that in the early days of any operation the operator aimed directly at the object to be fulfilled; he roughly estimated the difficulties and dangers, many of which he could not foresee, as the route

he was taking had never been traversed before. His was not the lot to elaborate and devise improvements, the necessity for which was as yet unknown. Hence, early methods were crude and devoid of niceties of execution. Then, improvements were added, until simplicity was overlaid with complexity. For a time the attention of operators was directed towards combating difficulties; their efforts were solely expended on details. When this had gone on for a time, a reaction set in. Complicated methods were abandoned, and a return was made in the direction of the primitive simplicity. In short, crude directness of purpose gave place to elaboration of method, which in its turn yielded to that effective simplicity which represented the high water mark of applied knowledge. For example, in Cæsarean section, suturing of the uterine wound was performed as far back as the beginning of the last century, and even earlier, one or, in some instances, three sutures being used. Subsequently suturing fell into disuse. He could remember, many years ago, discussing with one of the greatest authorities of the day on Cæsarean section—his colleague, Thomas Radford—who spoke strongly against suturing, stating that the unaided contraction of the uterus was sufficient to prevent leakage from its cavity. Subsequently many and varied ways of suturing the uterine wound had been advocated, but during recent years, although the use of sutures had remained universal, the method of applying them was usually of the simplest nature. As another example of returning tc previously relinquished methods in the course of operative evolution, take operations on the cancerous uterus which, in the first instance, were performed through the abdomen. In 1828 Blundell removed the entire uterus, through the vagina, for cancer; but the results were bad and the operation was abandoned. After this the cervix only was attacked through the vagina. Then, return was made to total removal with improved methods; ligatures were applied before the structures were divided and after removal of the uterus the vagina was packed with gauze, which acted as a drain. The latest method of removing the cancerous uterus was that of Wertheim, through the abdomen, the primitive path for the removal of uterine tumours. But greater skill and judgment were required for the removal of the uterus by the abdominal route. The frequently excessive duration of the abdominal operation, the depressing effects of the prolonged exposure of the open abdomen were depressing factors, to which might be added a greater risk of septic infection. The protracted administration of an anæsthetic was also of serious import. It had been found after lengthy periods of chloroform inhalation that death had occurred hours and even days after operation with no assignable cause other than the action of the anæsthetic. There was no evidence as yet that the abdominal operation afforded less risk of recurrence than the vaginal method. The inference was that when practicable the vaginal operation is distinctly to be preferred to the abdominal method, which should be reserved for exceptional cases. Again, the cure of vesico-vaginal fistula was performed in the early part of the last century by simply paring the edges of the opening and bringing them together with ordinary sutures. Then silver wire was substituted; then split leaden pellets, placed over the sutures, were squeezed together, so as to grip the sutures in place of tying them. Bozeman introduced metal plates with a series of holes through which the sutures were passed and the pellets fastened on; this was done in order to prevent the pellets being buried in the tissues by inflammatory swelling. All these modifications were found to be needless and injurious. At the present time silk-worm gut or catgut sutures were used in the ordinary way, which is practically

a return to the original method. The complicated modes of uniting the ruptured perineum with quilled-sutures and other elaborate devices had, in their turn, given place to the original simple suture. The mode of dealing with the stump of the pedicle in ovariotomy had passed through many varied phases. In 1842, Charles Clay ligatured the pedicle and brought the ligature through the lower end of the abdominal wound, partly to act as a drain, but more especially to provide for removal of the ligature when its separation from the pedicle had taken place. In 1861, Tyler Smith ligatured the pedicle, and after cutting the ligature short, dropped the stump into the abdomen. Next came the clamp in all its forms; then the stitching of the stump of the pedicle to the abdominal wound. After this was the reign of the drainage tube. At the present time we had reverted to the plan of cutting short the ligature and dropping the stump into the abdomen, only using the drainage tube in exceptional cases. When we glanced over the vista of operative evolution we encountered two prominent features; the absence of anything like finality, and the dominant tendency to revert to the primitive conception. What was orthodoxy to-day was heresy to-morrow. Surgery owed much to the gynæcologist who led the way in the performance of abdominal section. It was the gynæcologist who showed that the abdominal cavity might be laid open and its contents dealt with freely. This was not possible without the antiseptic methods we owed to Lister. These again illustrated the change from crude simplicity through complexity to simplicity shorn of its crudities.

Dr. J. B. Hellier (Leeds) showed a Pelvis Deformed by Infantile Paralysis. (This communication appears as an original article on p. 177 of this number of the Journal.)

Mr. Richard Favell (Sheffield) was unanimously elected President of the Society for the year 1906.

The following office-bearers were also elected:—

Vice-Presidents: Sir William Sinclair, M.D., D. Lloyd Roberts, M.D. (Manchester), Owen Bowen, M.R.C.S., Arthur J. Wallace, M.D. (Liverpool), J. Braithwaite, M.D., C. J. Wright, M.D. (Leeds), John W. Martin, M.D., Percival E. Barber, M.R.C.S. (Sheffield).

Honorary Treasurer: E. Octavius Croft, M.D. (Leeds).

Honorary General Secretary: W. E. Fothergill, M.D. (Manchester).

PATHOLOGICAL SOCIETY OF MANCHESTER.

Meeting, January 17th, 1906, Prof. Lorrain Smith *in the Chair.*

Dr. Cuthbert Lockyer (London) gave a lantern demonstration on the Development and Retrogression of the Corpus Luteum.

The lecturer pointed out that the majority of pathological processes associated with lutein tissue were not the outcome of changes in the corpus luteum itself, but arose during the developmental stages of the Graafian follicle, *i.e.*, before that body attained anything like its full maturity. In this way the different types of lutein cysts, also lutein hæmatomata, and even lutein abscess and calcification have, as a rule, nothing to do with the true yellow body. Such changes take their origin for the most part in atresic follicles which have acquired a lutein lamina before undergoing retrogression. Mention was especially made of the type of lutein cyst which the lecturer described as "composite lutein cystoma," a large tumour

that is, which he had only found in association with vesicular mole and chorioepithelioma. The actual causation of this peculiar type of lutein excess was still obscure, but its relationship to the ovular changes could scarcely be accidental, nor did the speaker think they were secondary, as did the German authority Gottschalk. The fascinating theory that lutein excess accounted for trophoblastic overgrowth had occupied Dr. Lockyer's close attention, but control investigations on ovaries from cases of normal gestation and chorioepithelioma failed to convince him that excess of lutein tissue was peculiar to vesicular disease and chorioepithelioma. Another difficulty which stood in the way was the possible confusion of displaced lutein tissue and decidual reaction in the ovarian stroma, and the lecturer threw out the suggestion that the lutein cell and the decidual cell were histogenetically one.

Mr. Richard Favell (Sheffield) showed a Fibromyomatous Uterus removed, on account of hæmorrhage, by abdominal hysterectomy from a woman, who weighed 18 stones. The patient was so fat that no accurate diagnosis was possible, but the uterus was found to contain a vesicular mole of considerable size, while special interest lay in the fact that both the ovaries contained small lutein cysts.

Dr. Carlton Oldfield (Leeds) showed large Double Lutein Cysts from a patient who had expelled a vesicular mole. The uterus of this patient was also removed because it contained a new growth, which on examination proved to be a typical example of chorioepithelioma. Dr. Oldfield regretted that Dr. Lockyer had not been able to confirm the view that excess of lutein had a causal connection with vesicular mole and with chorioepithelioma, for, regarded as a theory, this view was one of great beauty.

Dr. Fothergill thought that as so many cases of chorioepithelioma had been recorded as occurring in men, who had certainly no excess of lutein tissue, we could hardly expect to prove that the development of these new growths depended upon the presence of lutein tissue.

EDINBURGH OBSTETRICAL SOCIETY.

Meeting, Wednesday, January 10th, 1906, J. W. Ballantyne, M.D., F.R.C.P.E., *President, in the Chair.*

Eclampsia and Melancholia.

The Secretary read a paper by Dr. Fothergill on a case of melancholia which had been treated by thyroid extract. The patient was a primipara, who had severe eclamptic seizures during the second stage of labour and the early puerperium. These were treated by venesection, wet packing, etc., and recovery took place, the albuminuria disappearing. The patient, however, continued to suffer from very severe headache, and to be sleepy and occasionally stuporose. On the 16th day symptoms of melancholia developed, associated with slow pulse, stupor and restlessness. Thyroid extract was administered, the dose being 5 grains in tabloid each day. Three days later improvement was noted, the pulse having quickened considerably. In a few weeks the melancholic symptoms had disappeared, and six months later there was no recurrence. Dr. Fothergill suggested that the eclampsia and the melancholia were due to one and the same toxic condition, and thought that the rapid cure of the melancholia was to be attributed to the thyroid treatment.

Dr. RITCHIE doubted if the conclusions drawn were correct. In mental disease thyroid was usually contra-indicated if restlessness or excitement was present.

Dr. PATERSON mentioned cases in which he had seen mental depression caused by thyroid.

Dr. OLIPHANT NICHOLSON supported the writer, and pointed out that mental depression associated with hyperemesis gravidarum or slight pre-eclamptic symptoms was benefited by thyroid.

Dr. BARBOUR thought the conditions were probably due to separate toxins, and suggested that the melancholia might be due to a septic infection.

Dr. MCVIE thought that the connection between the two diseases was "not proven."

Dr. FORDYCE had seen two cases in which loss of memory following eclampsia had rapidly disappeared without thyroid.

Dr. PORTER agreed with Dr. Fothergill, and compared the action of alcohol and bacterial toxins to the poison present in eclampsia.

The PRESIDENT agreed with Dr. Barbour, but thought that more reports of cases of a like nature would be helpful. He instructed the Secretary to convey the thanks of the Society to Dr. Fothergill.

STEREOSCOPIC PHOTOGRAPHS.

Dr. BARBOUR SIMPSON read a communication on the value of stereoscopic photographs in the teaching of obstetrics and gynæcology. He showed numerous photographs, and indicated their great superiority over other methods of illustrative teaching.

The PRESIDENT thanked Dr. Simpson, and after several members had spoken, Dr. SIMPSON replied.

PYURIA IN THE FEMALE.

Dr. FREDERICK PORTER read a paper on "Pyruria in the Female." He gave details of several cases, both in children and adults. He discussed the sources of infection, and dealt briefly with the bacteriology of the condition. Vague indispositions might frequently be traced to pus in the urine. In the puerperium it constituted a very grave risk, being a cause of septic trouble.

The PRESIDENT, Dr. BERRY HART, Dr. RITCHIE and Dr. FORDYCE spoke, after which Dr. PORTER replied.

UTERINE FIBROID TUMOURS.

Dr. FREELAND BARBOUR showed three uterine fibroid tumours, removed by hysterectomy, illustrating the varieties of uterine displacements occurring in such cases.

APROSOPOUS FŒTUS.

The PRESIDENT exhibited an aprosopous fœtus, a female, born at full time. The features of the face were absent with the exception of an imperfectly developed mouth, and the brain was represented by a small sac on the basis cranii. A slight depression on the top of the head might correspond to a rudimentary orbit. There was no abnormality of the trunk or limbs present. Monsters of this type constituted the lowest form of maldevelopment possible.

GLASGOW OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting, December 20th, 1905, Dr. J. K. Kelly, *President, in the Chair.*

Specimens.

Dr. Balfour Marshall showed twins with one placenta, two cords, with velamentous insertion of both.

Dr. S. J. Cameron: Stereoscopic photograph of double twin pregnancy in one tube.

The President: (1) Pyosalpinx; (2) tubo-ovarian cyst.

Dr. Scott Macgregor read a paper on

Double Uteri: A Clinical Study.

This condition, being much more common than is generally supposed, is of great importance as bearing on the question of superfœtation. Having briefly given the history of recorded cases, Dr. Macgregor divided the condition into three classes:—1. Uterus didelphys, the two halves of the uterus remaining externally distinct; vaginæ separate, each uterus having its own ovary and Fallopian tube. As a rule one uterus is larger than the other; one half may be shut off externally by the vagina ending blindly. 2. Uterus bicornis unicollis; the lower part of the uterus appears normal, but there is a depression at the fundus. 3. A septum in the interior forming two cavities; two vaginæ may be present; this form is called uterus subseptus. Dr. Macgregor mentioned several cases which had come under his care—(*a*) A case of pregnancy in a double uterus, with hæmorrhage from the other half of the uterus; (*b*) a case of primary amenorrhœa in a girl of 17, who had a large sausage-shaped swelling on one side of the abdomen, with a smaller tumour connected with it. On incision of the hymen the condition was found to be one of retained menstrual fluid filling a double uterus; (*c*) a case where the vagina was divided into two by a septum; at the roof of each a small cervix was felt, and two horns of the uterus could be made out.

The President thought the question came in of sepsis during pregnancy in the uterus that was empty.

Drs. Stark, Marshall, Cameron and McLellan discussed the paper.

Dr. Macgregor replied.

The President gave a lantern demonstration on the Various Pathological Conditions of the Tubes and Ovaries. Photographs and photomicrographs of hydrosalpinx, salpingitis and pyosalpinx were shown in contrast with those of tubo-ovarian cysts, tubo-ovarian abscess, etc.

REVIEWS OF RECENT BOOKS.

CLINICAL OBSTETRICS. By Robert Jardine, M.D., Professor of Midwifery in St. Mungo's College, Glasgow; Senior Physician to the Glasgow Maternity Hospital, &c. 2nd Edition. London: Rebman Ltd. Price 17s. net.

This book is based on a wide personal experience at the Glasgow Maternity Hospital, with which, as the author states in his preface, "for difficult obstetrical cases no hospital in the United Kingdom can compare." Every chapter bears evidence of the writer's exceptional opportunities, and for that reason alone his work deserves the careful study of all interested in this branch of medicine. As might be gathered from its title, the theoretical side of obstetrics scarcely comes within the scope of this work; and, as a matter of fact, what little there is does not at all reach the level of the practical part.

The one serious criticism we have to make—and it is a matter that admits of a very simple remedy—is that it is over-burdened with records of cases. In a text-book of this kind clinical reports should be used sparingly and with great discrimination, and only in order to illustrate some point in diagnosis or treatment. Its readers expect to find the essence of the writer's clinical experience extracted for them rather than to have to make their own deductions after wading through cases. For the most part these should be relegated to monographs and original papers, where they are in place as evidence in support of any definite line of argument, and where those who may wish can easily refer to them. Valuable as these cases are, we would urge the author in a future edition to reduce these reports to the smallest limits; the book would not be any the less useful and would be much more appreciated by both student and practitioner.

The chapter on eclampsia may be selected as a fair illustration of the author's method. It begins with a brief and not very satisfactory account of the pathology of this condition, followed by a very excellent clinical picture of the disease. No attempt is made to consider the possible meaning of the various pathological conditions which have been described, nor is the wider aspect of the disease as one of the manifestations of the toxæmia of pregnancy adequately considered. Thus its relation to hyperemesis and to acute yellow atrophy and so on is not brought out, nor is any distinction made between it and the nephritis of pregnancy; there is indeed, on the contrary, some confusion as to the relation of eclampsia to renal disease. With regard to the clinical part of the chapter we can find little to criticize, and as the book is professedly clinical and not systematic, this means that the author has succeeded best in doing exactly what he set out to do. The line of treatment which Dr. Jardine especially advocates is that of active promotion of elimination by the skin, the bowels, and the kidneys. This is done by hot packs, by purgation, *e.g.*, large doses of Epsom salts introduced through a stomach-tube, and by large infusions into the cellular tissue of normal

saline solution combined with a diuretic. Emphasis is laid on the value of these measures and especially of the last; but others are adopted in special circumstances—bleeding when there is a full bounding pulse, chloroform to control the fits, and so on. Morphia has been given up in the writer's practice, as he considers that it counteracts the effect of the infusions by lessening the excretion of urine. With regard to obstetric treatment the rules are neither so definite nor so precise. "Each case must, of course, be judged on its own merits, but, broadly speaking, in cases of convulsions before labour begins, the less interference with the uterus the better. In a case occurring early in pregnancy, and for the second time, emptying the uterus is called for. . . . If the fits cannot be controlled, the uterus should be emptied by *accouchement forcé*." These opinions, founded as they are on an extensive practical experience, are very interesting as illustrating the old adage, especially true in medicine, of "quot homines, tot sententiæ," for quite recently very divergent views have been expressed by Macé and Pierra, in Paris, on the matter of saline infusions; by Leipmann, from Bumm's Klinik, in Berlin, in regard to hot packs and obstetrical interference; and by de la Harpe, on morphia injections, from a study of thirteen years' work at the Rotunda Hospital, in Dublin. The greater part of this chapter on eclampsia—32 pp. out of 42—is taken up with the narration of cases treated by the author (thirty in number), a disproportion which will be sufficient justification for what we have already said on this matter. No doubt we might have obtained a much better impression of Dr. Jardine's methods if our industry had proved equal to the task of studying the details of these thirty cases as they deserve. We confess our shortcomings.

Due stress is laid throughout this work on the importance of asepsis in obstetrical practice. In the introductory chapter, we notice that no mention is made of the part played by Oliver Wendell Holmes in discovering the nature of puerperal fever, and we hope, after Dr. Cullingworth's paper in the number of this JOURNAL for December last calling attention to the way Holmes's essay on the contagiousness of puerperal fever has been overlooked by British and American writers, that the writer will make good this omission in a future issue. The complications of pregnancy are very thoroughly discussed, and we would call attention especially to the very excellent account of heart disease in pregnancy. We notice that there is no mention of a complication which has attracted a great deal of notice during the last four or five years, the pyelonephritis of pregnancy. Case ii., on p. 33, may be of this nature, but as the patient had passed a stone after an illness in a previous pregnancy, it may be a case of renal calculus with pyo-nephrosis as recorded, though no calculus was found in this illness, and the symptoms cleared up without operation.

The method of treating accidental hæmorrhage, as advocated by Dr. Jardine, is to empty the uterus when any active hæmorrhage is going on and uterine contractions are not active; the Rotunda method receives no support. This method, however, as authoritatively described, for instance, by Colclough in this JOURNAL, Vol. II., p. 153, does not appear to have been carried out in the Glasgow Maternity in its entirety, and therefore cannot be said to have been thoroughly tried. Bossi's dilator has been found of great service, but de Ribes' bag is damned by faint praise. The results of the treatment of serious accidental hæmorrhage do not seem to be very successful with the methods employed, so that we do not feel that the question of the value of the Dublin practice is in any way

affected by Dr. Jardine's unfavourable experience. Certainly his results are nothing like so striking as those recorded by Colclough.

The chapters on obstetric operations are most instructive, and not least so the sections on Cæsarean section. It strikes us, however, as a little unfortunate that the photographic reproductions of forceps delivery should show the operator in his every-day clothes, and with not even his coat off, but only the sleeves rolled up above the wrists. This does not look well as a matter of hospital technique, and in these days when practitioners are being urged to cover themselves in a washable gown or apron, as the nurses are expected to do, it suggests slovenliness. The statistics of the Glasgow Maternity at the end of the book are most interesting, and we would call attention to the large proportion of single women who are taken into the hospital. This is a lesson to London, where a strong prejudice still exists among hospital committees on this point, so that most of these women go into the poor-law infirmaries. Doubtless this is one of the reasons why there is such a wealth of obstetric material collected in Glasgow under one charity.

We commend this book to all engaged in the practice of midwifery as a sound and practical guide to diagnosis and treatment; all that the author advises has the merit of having been tested by himself, and is therefore of value as a first-hand opinion. We feel sure that its pre-eminently clinical character will appeal to all who are engaged in active obstetric practice.

Operative Gynäkologie. By Dr. A. Döderlein, Professor of Midwifery and Gynæcology, University of Tübingen; and Dr. B. Krönig, Professor of Midwifery and Gynæcology, University of Freiburg. Leipzig: Georg Thieme. 1st Edition. 1905.

The authors of this important work are well known for their valuable contributions to our knowledge of the bacteriology of different parts of the genital canal under ordinary conditions, and in connection with the function of reproduction. That scientific research does not unfit men for the practical work of their profession is clearly shown in this work, which displays a combination of scientific knowledge and accuracy with clinical and operative acumen that is sure to command for it a high place in the estimation of gynæcologists of all countries.

It is divided into General and Special parts. In the former a considerable space is of course devoted to aseptic technique. We notice that the cumol method of sterilising catgut is the one approved by the authors; the method of sterilization in boiling alcohol, introduced at the Pasteur Institute (Paris) by Répin, receives no mention. In disinfection of the hands the authors advise scrubbing with soap, hot water, and nail brush for fifteen minutes, then careful washing to remove the soap, and, finally, immersion for five minutes in 1—500 sublamin (mercuric sulphate-ethylenediamine) solution. They prefer sublamin to corrosive sublimate for the reason that it is absolutely non-irritating, and can therefore be used in much stronger solution than the better-known mercurial salt. It is noteworthy that alcohol is not used in any stage of the process. The use of rubber gloves in operating is strongly recommended, and great stress is laid upon the necessity of avoiding infection of the skin of the hands by contact with virulent pus or septic discharge; if such an accident should occur to a surgeon, according to the authors, three days' abstinence from operating must be observed before the hands

are to be regarded as safe. During this period the organisms may be mechanically removed, or if not they will lose their virulence, as they lead only a saprophytic existence in the skin.

Very interesting sections dealing with the prophylaxis of post-operative ileus and of post-operative pneumonia are also found in this part of the work. The subject of anæsthesia is dealt with very fully, an elaborate apparatus being described and figured for the administration of chloroform and ether in combination. Local anæsthesia the authors consider as of no great practical value in gynæcological surgery, for the reason that no local anæsthetic is known which will abolish the sensitiveness of the parietal peritoneum. The technique of spinal anæsthesia is described, but this method is not greatly commended. The closure of the abdominal incision is treated in great detail; the authors recommend the use of catgut throughout and practice the continuous suture in the usual three layers. Some German operators sew up the abdominal wound in five layers, viz., peritoneum, posterior sheath, muscle, anterior sheath, skin and subcutaneous tissue. The various methods of opening the abdomen are next discussed, including the median, extra-median, and transverse incisions; of the latter there are two varieties—that of Küstner, in which the skin is incised transversely, the deeper structures longitudinally; and that of Pfannenstiel, in which skin and sheath are both divided transversely, the muscle and peritoneum longitudinally. The authors regard the transverse incision as objectionable in septic cases on account of the risk of infection of the dead space opened up between the layers of the abdominal wall by this method.

A very interesting discussion follows of the general results of removal of the ovaries, and of the uterus both with and without the ovaries; the conclusions reached by the authors are quite in accordance with the general practice of gynæcologists in this country.

In the second or Special division, complete and profusely illustrated descriptions will be found of all the gynæcological operations practised at the present day. Naturally, the methods employed are not always those with which we are most familiar in this country, but British operators will learn much from a careful study of the singularly lucid descriptions presented by the authors of this work. In some instances the methods advocated are inferior to our own; this is certainly so in the case of ventrofixation for backward displacement. The method of the authors is to unite, by a single suture on each side, the uterine cornu close to the round ligament with the corresponding side of the abdominal wound, the suture passing through parietal peritoneum, fascia and muscle. It appears impossible by this method to obtain a sufficiently broad area of peritoneal contact to allow of the formation of adhesions strong enough to retain the uterus in position. Operations for prolapse are fully discussed, and the method most prominently illustrated is that in which the anterior or posterior fornix is opened and the body of the uterus brought down into the vagina and united by suture to the vaginal walls—procedures associated with the names of Freund and Wertheim. These operations, which are not practised in this country, are only recommended for cases of complete procidentia in which less severe operations have proved unsuccessful.

The major abdominal and vaginal operations are fully described, and are illustrated by a remarkably fine series of coloured drawings, the execution of which reflects the greatest credit upon the lithographers. The publishers are to be congratulated upon having produced a very handsome volume.

SEMMELWEIS'S GESAMMELTE WERKE. Herausgegeben und zum Theil aus dem Ungarischen übersetzt, von Dr. Tiberius von Györy, Privatdozent an der Universität zu Budapest, mit Unterstützing der Ungarischen Akademie der Wissenschaften, mit dem Portrait von Semmelweis und einer Abbildung seines Grabmals. Jena: Gustav Fischer, 1905. 12 marks. Pp. 604 (Semmelweis's Collected Works).

This collection of the writings of a man so famous for his high services to humanity should be placed in every medical library, especially in those attached to lying-in institutions. His great monograph on childbed fever is reproduced entire, title-page included with date 1861, taking 330 pages. Dr. Györy has also added Semmelweis's famous open letters to professors, as well as correspondence and replies; instructive and pathetic records of a warfare now long accomplished. After life's fever, very fitful in his case, Semmelweis sleeps well and malice domestic can touch him no further. As for "foreign levy," he was luckier than King Duncan, for it was raised not against him, but in his favour, by Dr. C. H. F. Routh, whose now historic paper on the causes of endemic puerperal fever in Vienna has been very properly placed in this collection of the great obstetrician's writings.* We also find in full, as in the case of all the other essays in the work, Semmelweis's article, originally published in an Hungarian newspaper in 1860, giving his opinions on puerperal fever as compared with those of British authorities in his day. Dr. Tiberius von Györy deserves high commendation for the service he has done to medical literature.

*Our readers are aware that we have recently indicated how this veteran countryman of ours was the first to make known in Great Britain the work that Semmelweis did in Vienna. ("Oliver Wendell Holmes and the Contagiousness of Puerperal Fever": *Journal of Obstet. and Gynæcol.*, December, 1905, p. 369.)